Ingeteam

Communication accessories in INGEREV recharging stations

Installation and usage manual
Manual de instalación y uso
Manuel d'installation et usage
Manuale d'installazione e uso

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Questo documento può essere soggetto a modifiche.

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1. About this manual

The purpose of this manual is to describe communication in INGEREV recharging stations. All the recharging stations can be accessed both locally or remotely, using - for the latter - an external modem located in the installation or a USB modem if requested upon placing the order.

Configuration and monitoring of all stations is carried out using the INGECON SUN Manager software provided by Ingeteam.

1.1. Scope of application

This manual is valid for all the models of the following INGEREV families:

INGEREV GARAGE Basic

INGEREV GARAGE

INGEREV CITY

1.2. Recipients

This document is intended for qualified personnel.

The status of qualified personnel referred to in this manual will be, as a minimum, that which meets all the standards, regulations and laws regarding safety applicable to the tasks of installing and operating all the components of the installation.

Any operations carried out by personnel not authorised to do so by Ingeteam can lead to the annulment of the unit's original warranty.

The responsibility for designating qualified personnel will always fall to the company to which the personnel belong. It is necessary to decide which workers are suitable or not for carrying out specific work to preserve their safety at the same time as complying with occupational safety legislation.

These companies are responsible for providing appropriate training in electrical equipment to their personnel and for familiarising them with the contents of this manual.

1.3. Symbols

This manual uses various symbols to emphasise and highlight certain texts. The general meanings are explained below.

General warning.

Read the section indicated.

Electrical danger.

Prohibition.

2. Safety

This section describes the safety warnings and the Personal Protective Equipment used in the unit.

2.1. Safety conditions

General warnings

The operations described in the manual may be performed only by qualified personnel.

The status of qualified personnel referred to in this manual will be, as a minimum, that which meets all the standards, regulations and laws regarding safety applicable to the tasks of installing and operating this unit.

All applicable safety-related legislation for electrical work must be complied with. Danger of electric shock.

Compliance with the safety instructions set out in this manual or in the suggested legislation does not imply exemption from other specific standards for the installation, place, country or other circumstances that affect the unit.

Opening the door of the housing does not imply there is no voltage inside.

There is a risk of electric shock even after disconnecting all power sources from the system.

Only qualified personnel may open it, following the instructions in this manual.

The entire manual must be read and understood in full prior to manipulating, installing or operating the unit.

Following is a list of the basic obligatory safety standards for each country:

- *RD 614/2001* in Spain.
- *CEI 11-27* in Italy.
- *DIN VDE 0105-100* and *DIN VDE 1000-10* in Germany.
- *UTE C18-510* in France.

Category III - 1000-Volt measuring instruments must be used for checking for the absence of voltage.

Ingeteam accepts no liability for any damages caused by improper use of the equipment. Any work carried out on any equipment which implies a modification of the original electrical arrangements must be proposed in advance to Ingeteam. These must be studied and approved by Ingeteam.

Carry out all control and handling without voltage.

As a minimum security measure in this operation, the so-called **5 golden rules** should always be followed:

1. Disconnect.
2. Prevent any possible feedback.
3. Check there is no voltage.
4. Ground and short circuit.
5. Protect from live elements, if any, and put up safety signs around the work zone.

Until these five steps are completed, the work area cannot be considered voltage-free and any work performed will be considered to be work on live equipment.

Potential hazards for the equipment

Bear in mind the following warnings concerning protection of the equipment.

After all duly authorised handling, check that the equipment is ready to start operation. Only after this can it be connected following the instructions in the manual.

Do not touch boards or electronic components. The more sensitive components can be damaged or destroyed by static electricity.

Do not disconnect or connect any terminal while the unit is operating. Disconnect and check for absence of voltage first.

2.2. Personal Protective Equipment (PPE)

When working on the unit, use the following safety equipment recommended by Ingeteam as a minimum.

Name	Explanation
Safety footwear	In compliance with standard *UNE-EN-ISO 20345:2012*
Helmet	In compliance with standard *EN 397:1995*
Helmet with face shield	In compliance with Standard *UNE-EN 166:2002*, wherever there are directly accessible live parts
Working clothes	Close-fitting, non-flammable, 100% cotton
Dielectric gloves	In compliance with standard *EN 60903:2005*

Tools and/or equipment used in live work must have at least Category III-1000 Volts insulation.

Should the country's regulations demand another kind of personal protection, the equipment recommended by Ingeteam should be appropriately supplemented.

2.3. Waste handling

At the end of the useful life of the printed circuit boards they must be sent to an authorised manager to be correctly recycled.

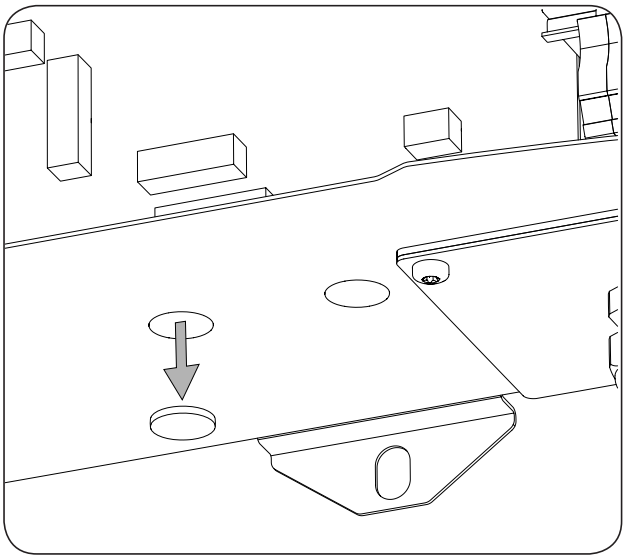
3. INGEREV GARAGE Basic

3.1. Installing packing glands

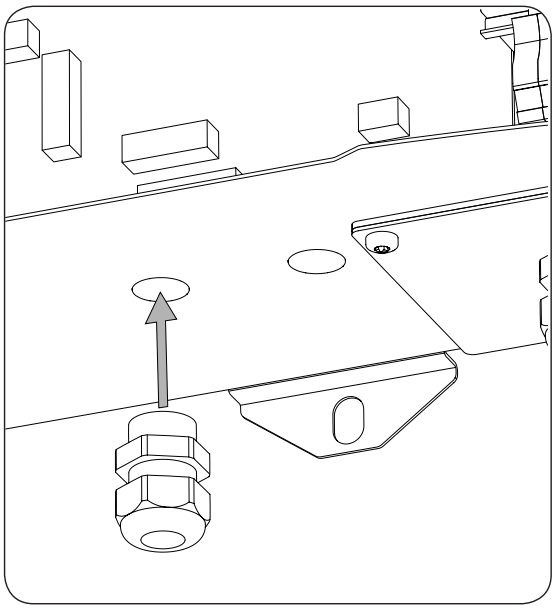
In order to install the communication accessories in INGEREV GARAGE Basic recharging stations it is necessary to install packing glands to transfer cables between stations.

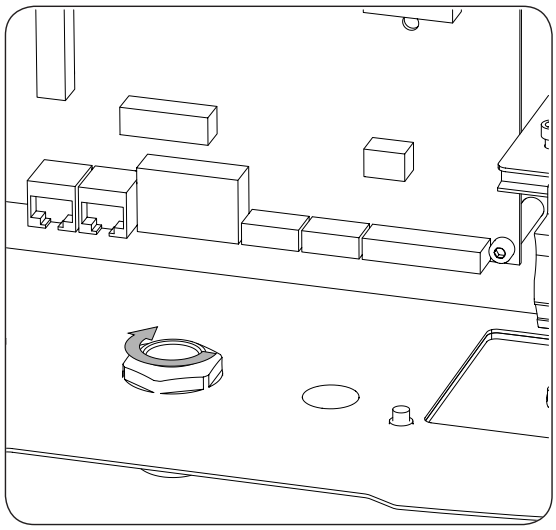
Follow the instructions below to install the packing glands:

1. Punch out one of the pre-cut holes from the lower connection plate.

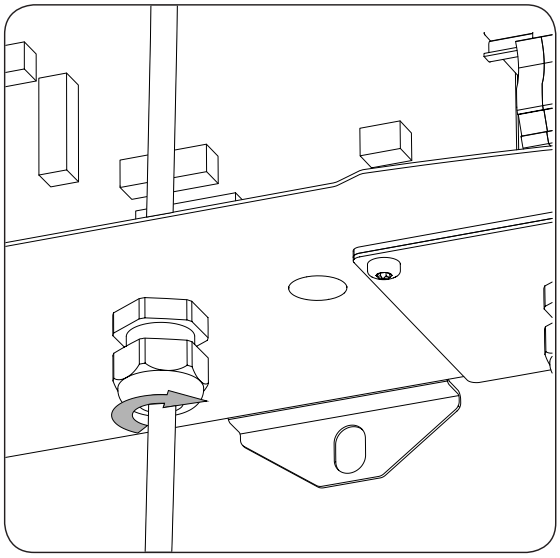


2. Insert the packing gland into the hole and screw the nut.





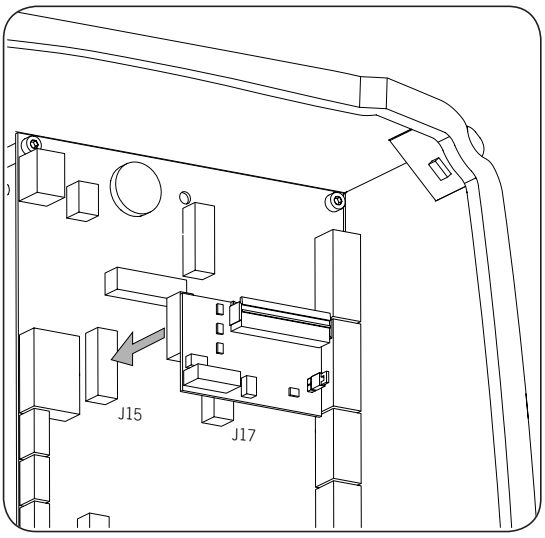
3. Thread the cabling through and tighten the packing gland. Leave margin so that the cabling is not tense.



3.2. Local communication

Follow the instructions below to complete the local connection.

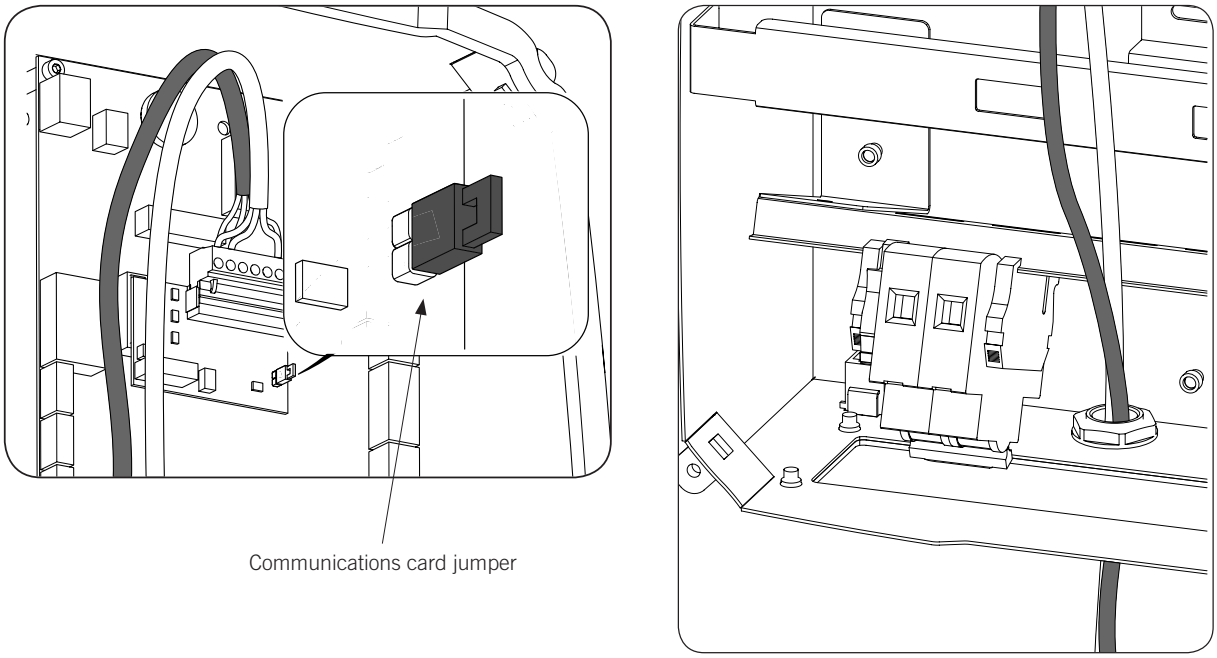
1. Connect the RS-485 communications card in all the recharging stations that make up the communication ring. It must be inserted into connectors J15 and J17.

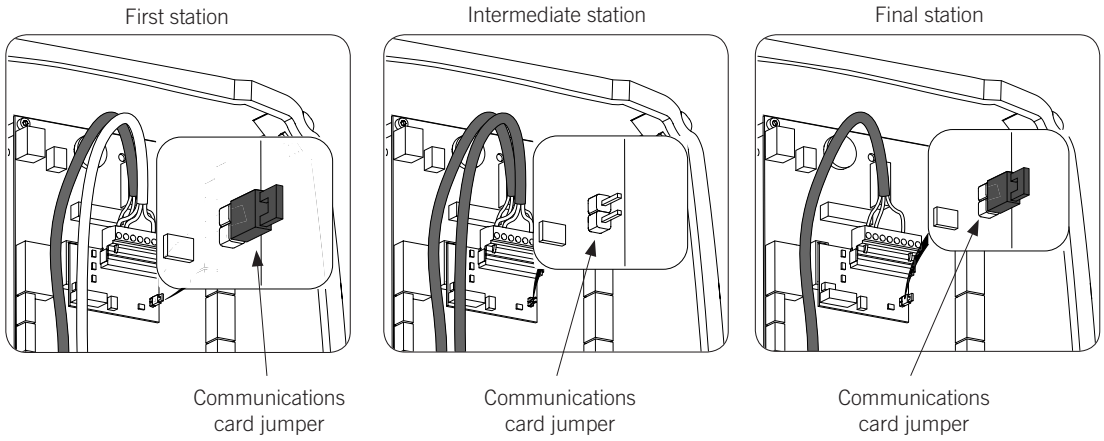


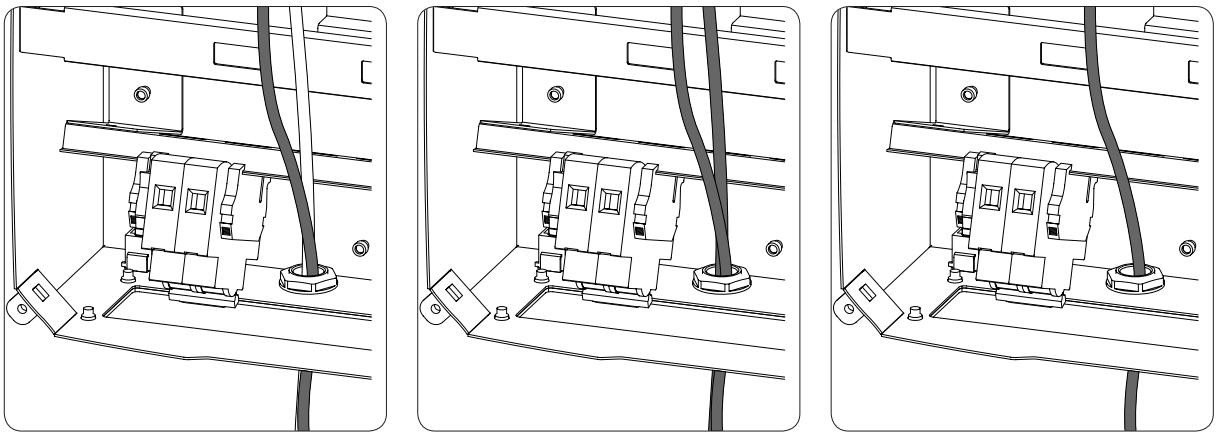
2. Connect the wiring that joins the communications card to the communications card of the following recharging station (see the dark grey cabling in the following figure).

Pin	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

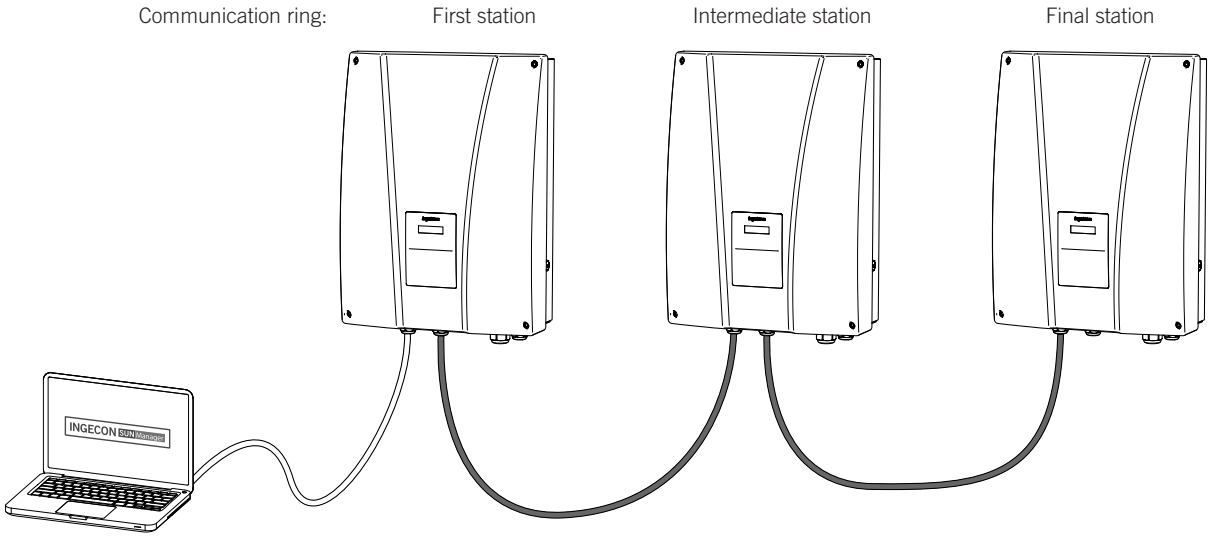
Use a USB to RS-485 converter (not supplied by Ingeteam) to connect the computer to the first station of the communication ring (white cable in the following figure).







The jumper of the RS-485 cards must be removed in all the intermediate stations of the communication ring.

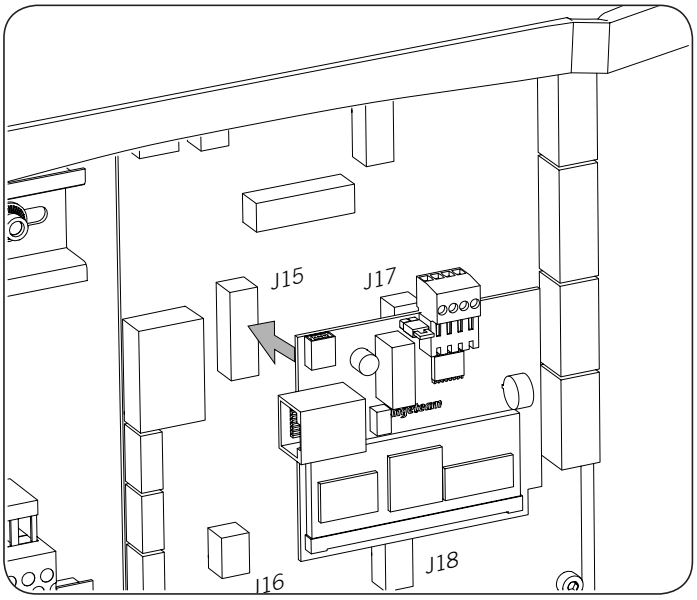


A maximum of 10 units can be interconnected.

3.3. Remote communication

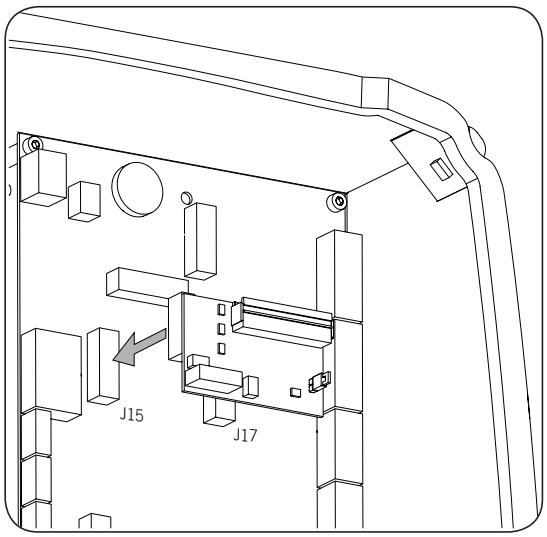
3.3.1. Remote communication via external modem

1. Connect the communications card with Ethernet connection to one of the recharging stations located at one end of the installation in order to start the communication ring. It must be inserted into connectors J15 and J17.



Pin	Signal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Install the RS-485 communications cards in the rest of the recharging stations that make up the communication ring. They must be inserted into connectors J15 and J17.

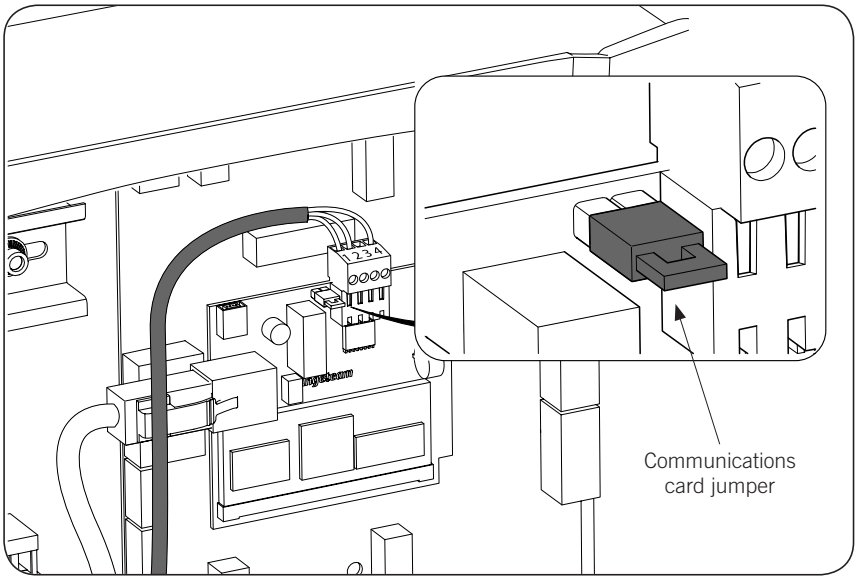


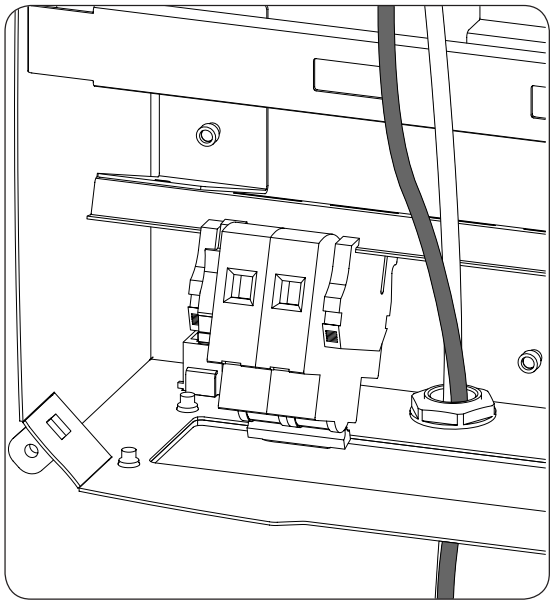
Pin	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

3. Connect the wiring that joins the communications card to the communications card of the following recharging station (see the dark grey cabling in the following figure).

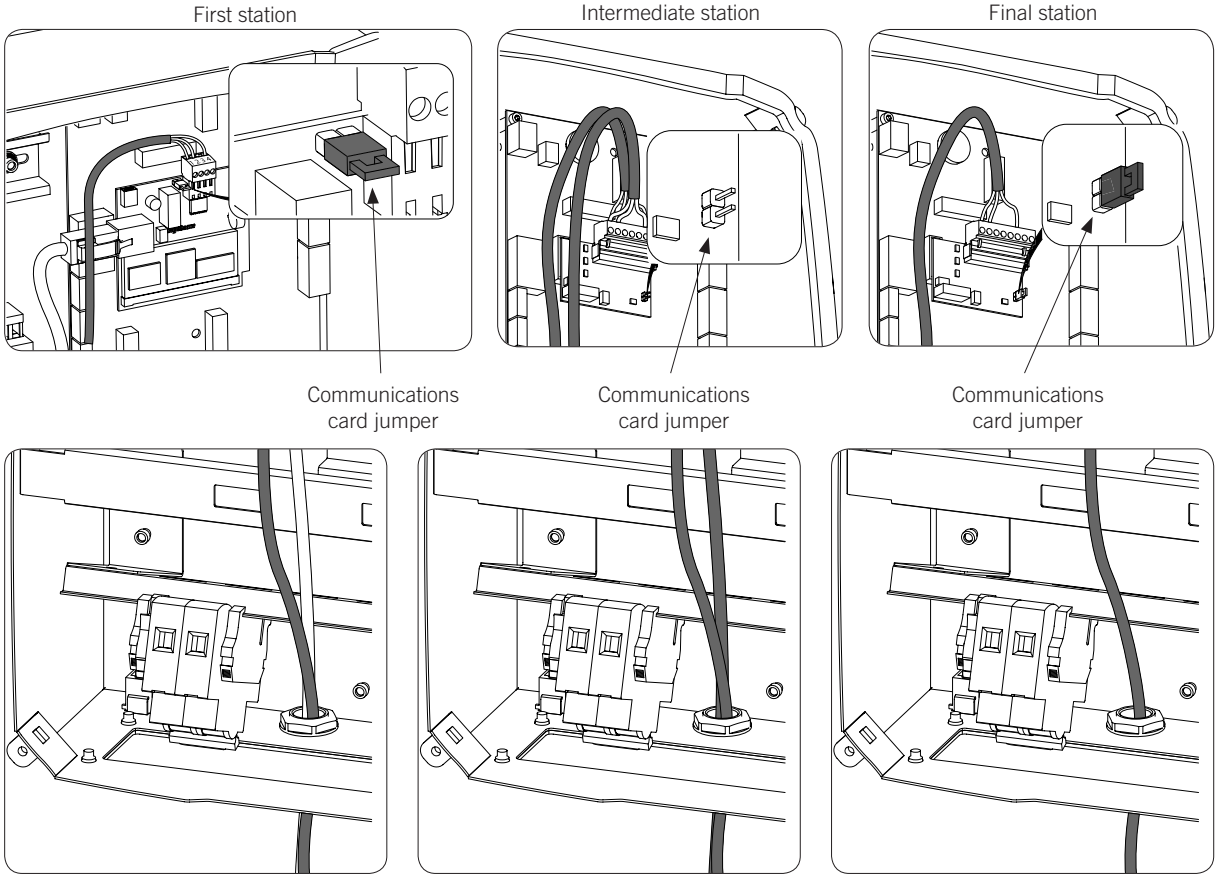
Connect the modem to the communications card of the first recharging station (see the white cable in the following figure).

The jumper of the communications card of the first recharging station must remain in place.

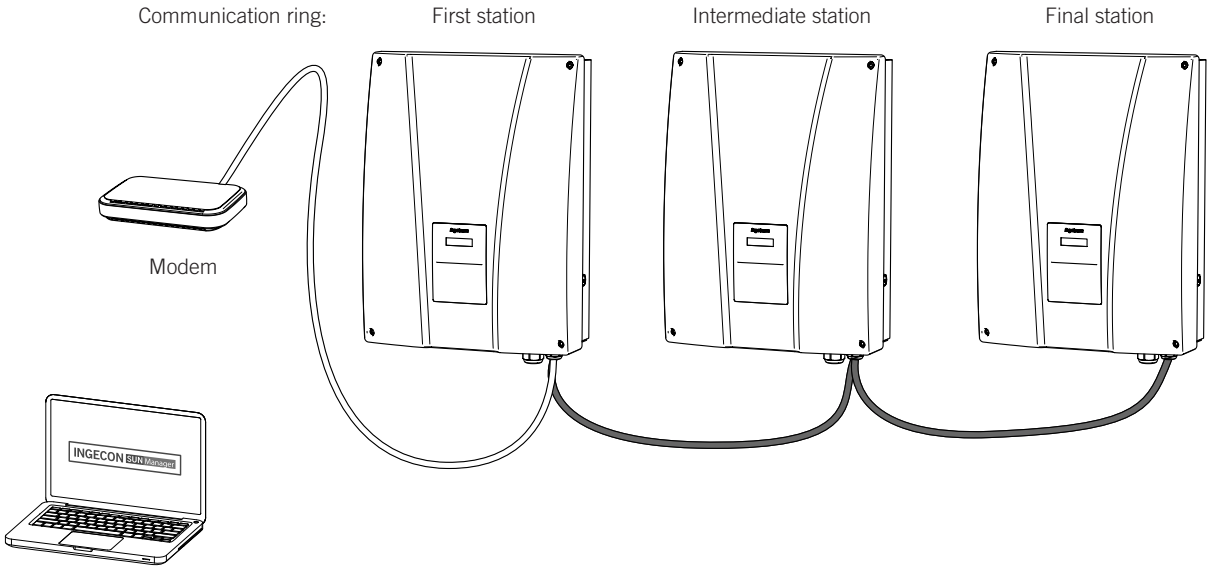




4. Connect the rest of the recharging stations of the communication ring as shown in the following figures.



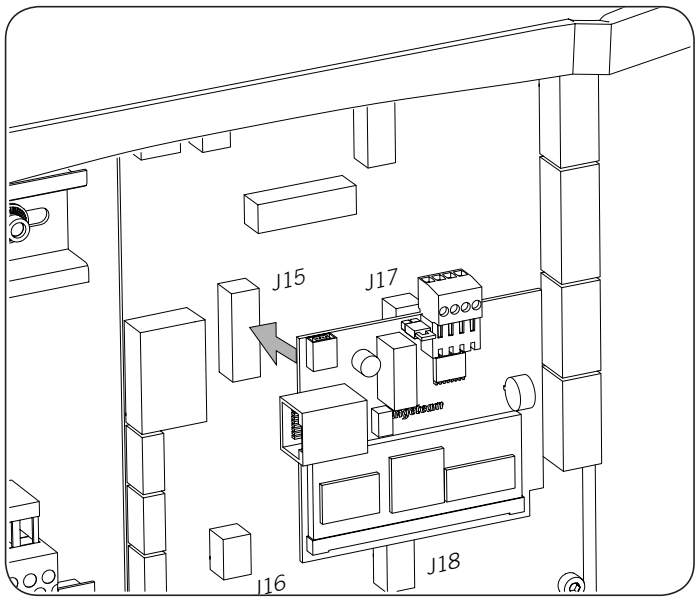
The jumper of the RS-485 cards must be removed in all the stations except for the final station on the communication ring, where it must be installed.



A maximum of 10 units can be interconnected.

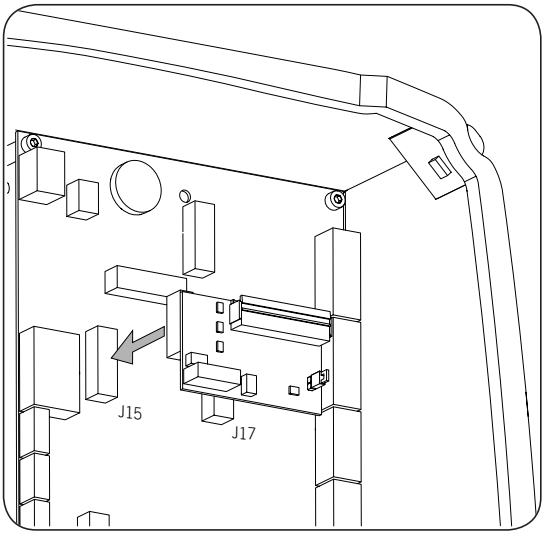
3.3.2. GPRS/3G remote communication via USB modem

1. Connect the communications card that will be connected to the USB modem in one of the recharging stations located at one end of the installation in order to start the communication ring. It must be inserted into connectors J15 and J17.



Pin	Signal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Install the RS-485 communications cards in the rest of the recharging stations that make up the communication ring. They must be inserted into connectors J15 and J17.

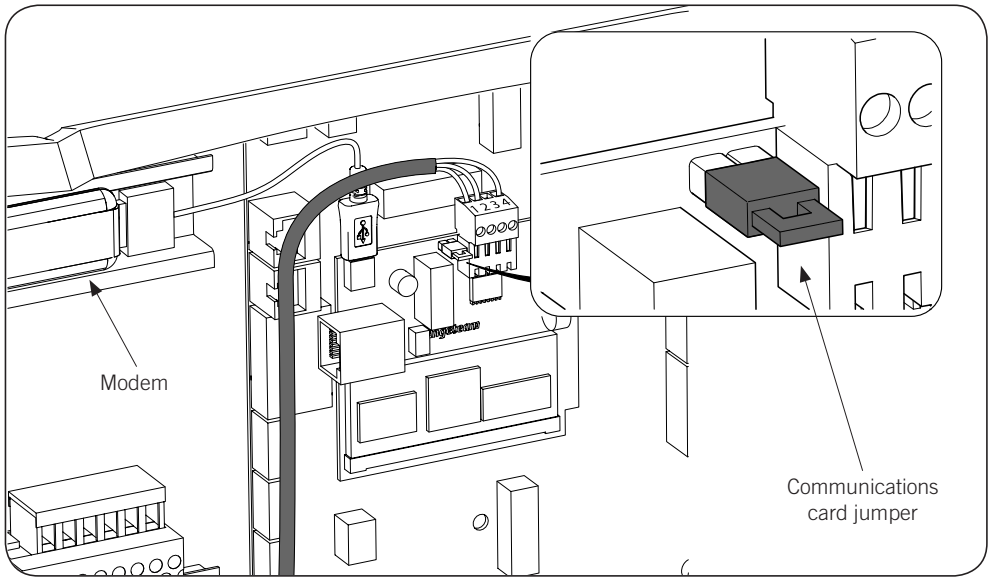


Pin	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

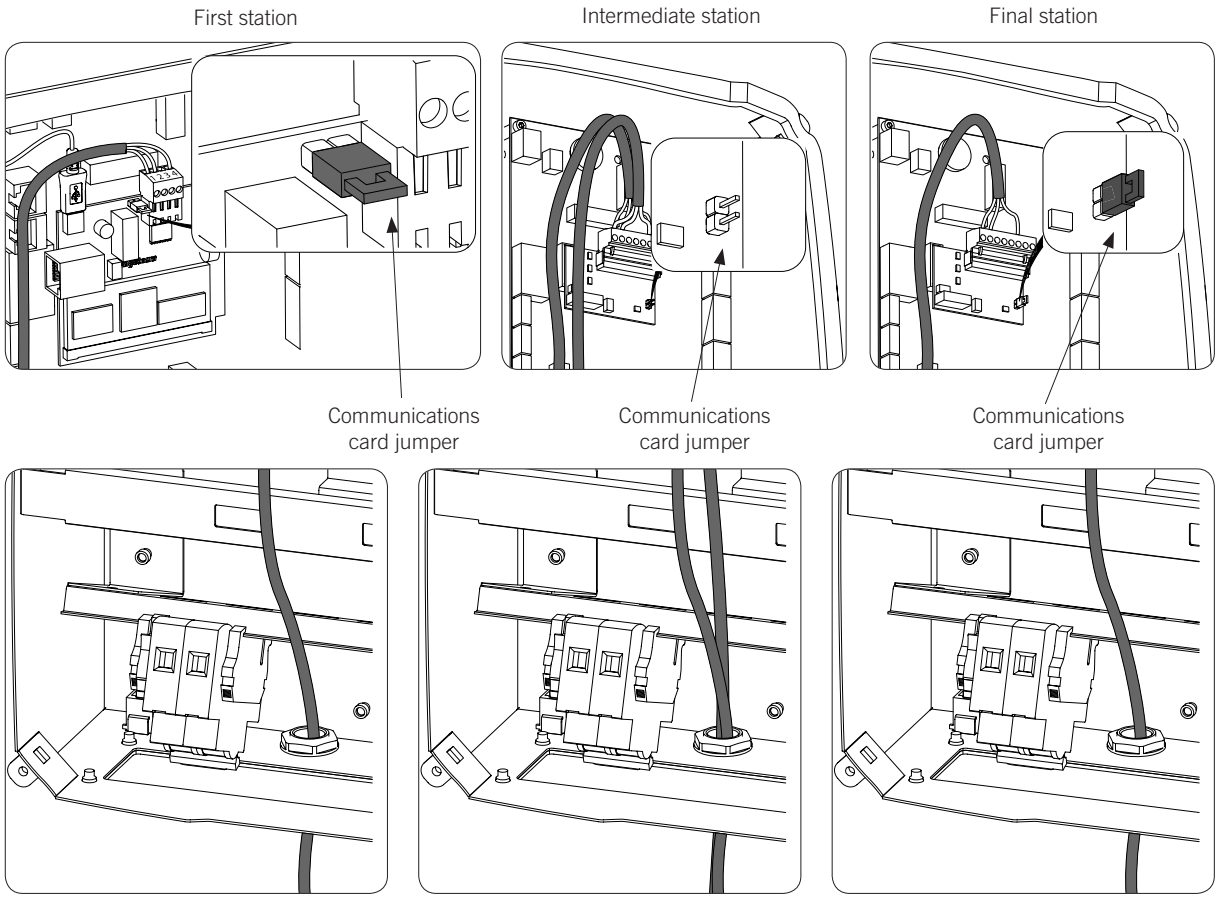
3. Connect the wiring that joins the communications card to the communications card of the following recharging station (see the dark grey cabling in the following figure).

Connect the USB modem to the communications card of the first recharging station to obtain the GPRS/3G connection.

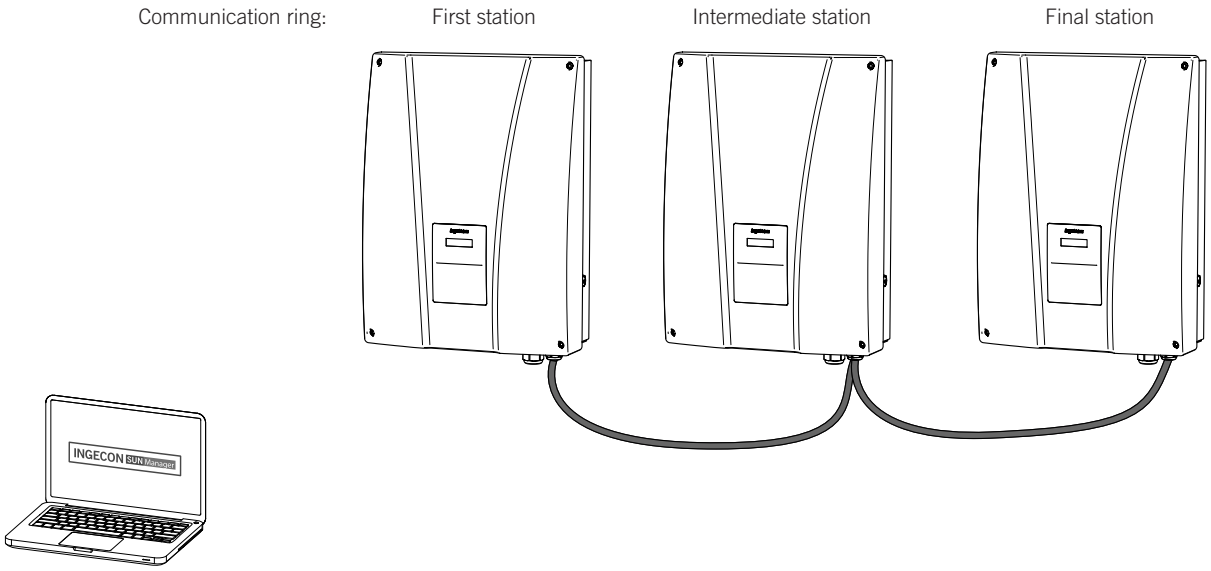
The jumper of the communications card of the first recharging station must remain in place.



4. Connect the rest of the recharging stations as shown in the following figures.



The jumper of the RS-485 cards must be removed in all the stations except for the final station on the communication ring, where it must be installed.

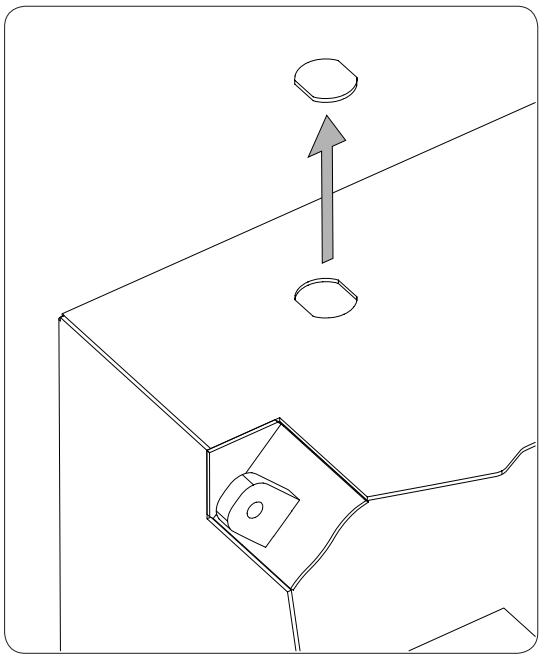


A maximum of 10 units can be interconnected.

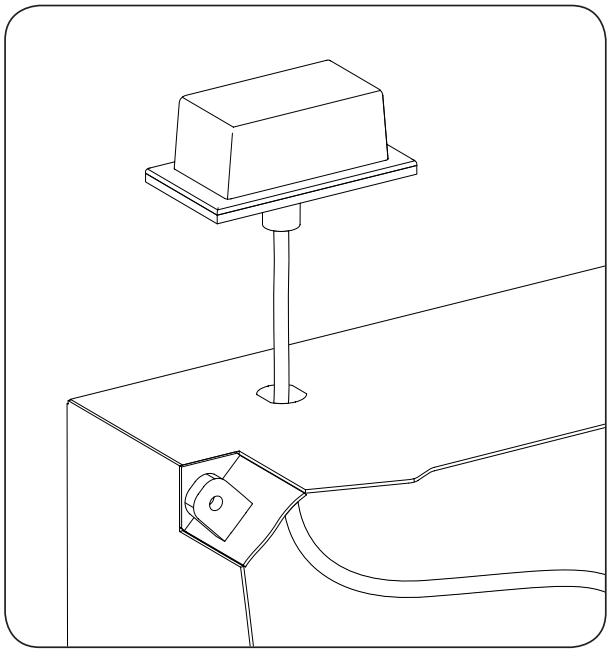
Antenna for USB modem

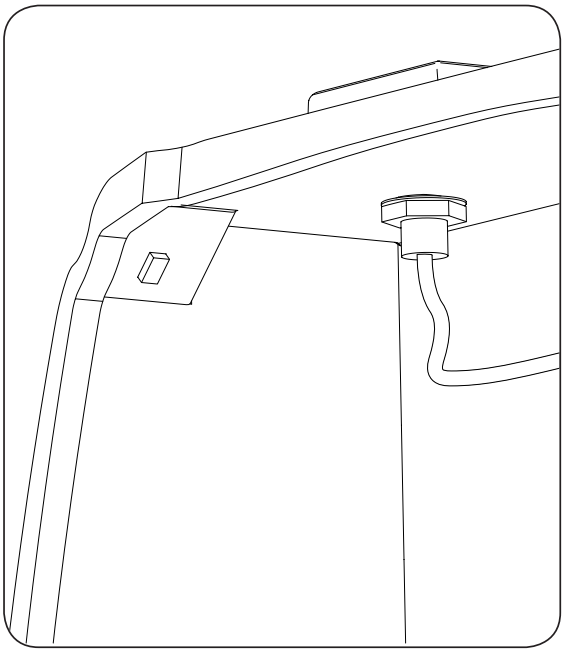
Optionally, an exterior antenna can be requested to boost the modem signal. The connection process is shown below.

1. Punch out the pre-cut hole from the top part of the station.



2. Thread the antenna wiring through the hole and attach the antenna to the station using the nut supplied.





3. Connect the modem antenna cabling.

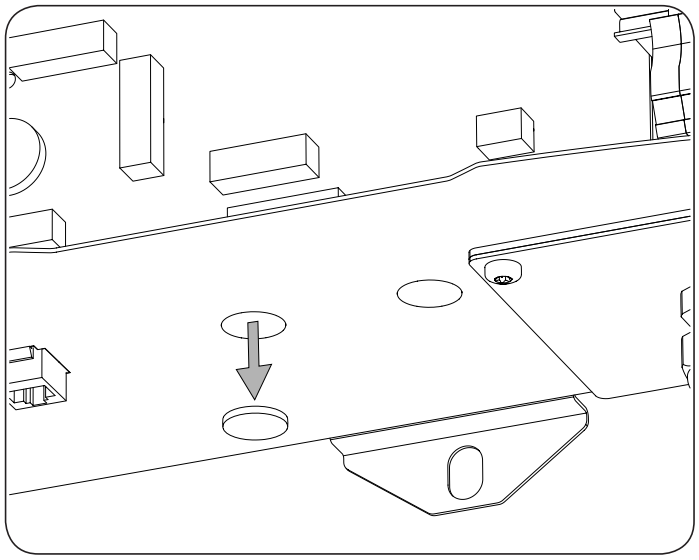
4. INGEREV GARAGE

4.1. Installing packing glands

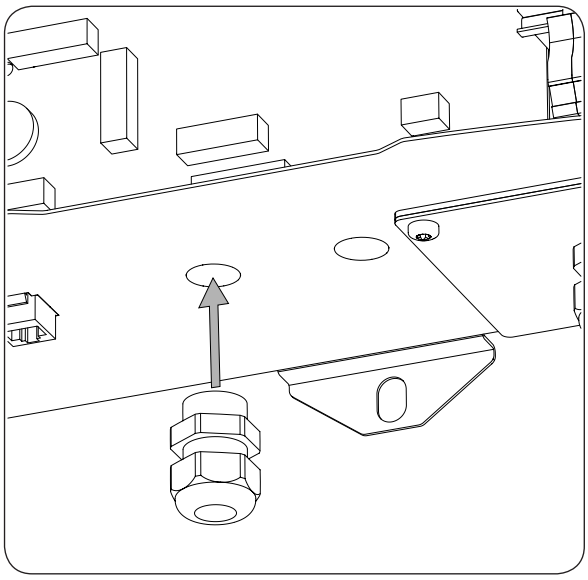
In order to install the communication accessories in INGEREV GARAGE recharging stations it is necessary to install packing glands to transfer cables between stations.

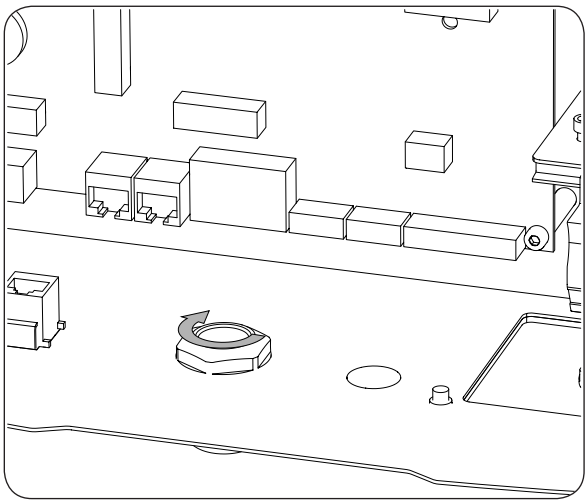
Follow the instructions below to install the packing glands:

1. Punch out one of the pre-cut holes from the lower connection plate.

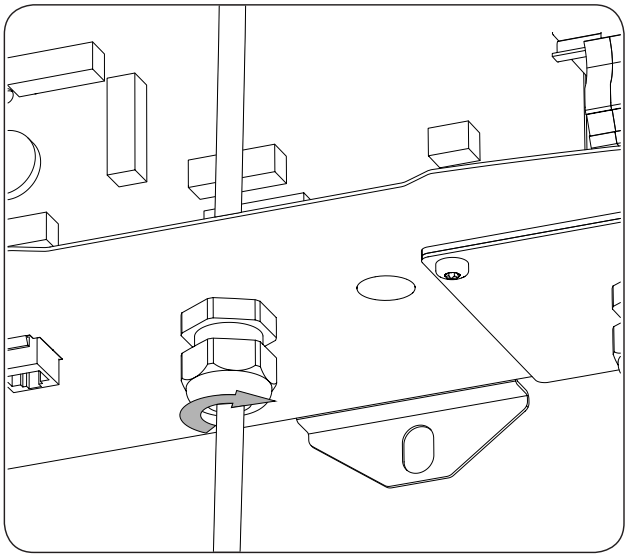


2. Insert the packing gland into the hole and screw the nut.





3. Thread the cabling through and tighten the packing gland. Leave margin so that the cabling is not tense.

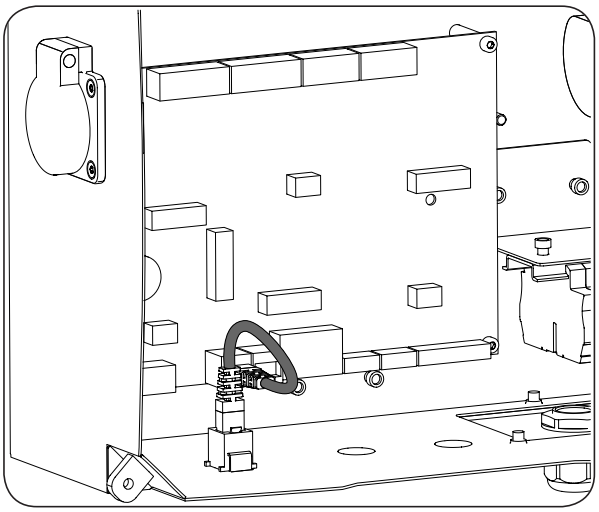


4.2. Local communication

INGEREV GARAGE recharging stations have a local RS-485 data bus with an RJ45 connector that enable interconnection between the stations. Consult the corresponding installation manual for more information on this subject.

4.3. Remote communication

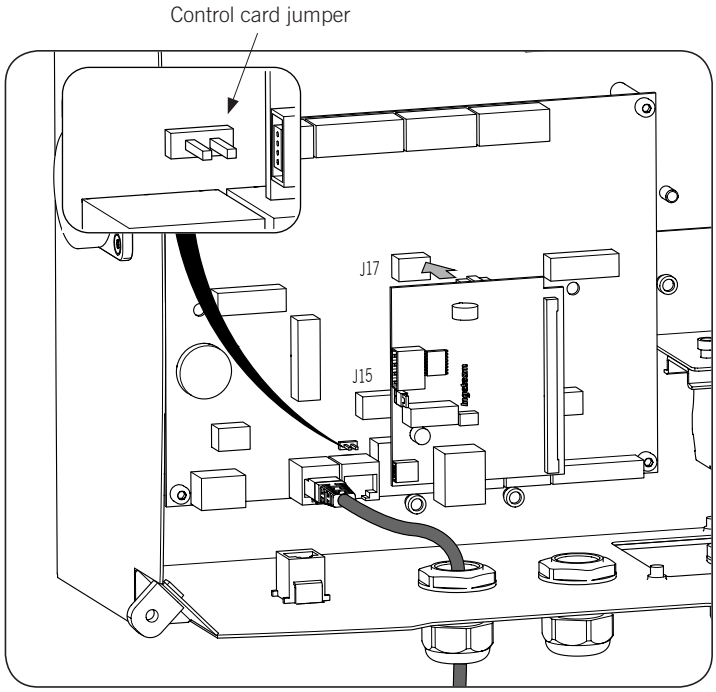
To enable remote connections via Ethernet or using a USB modem in INGEREV GARAGE recharging stations it is necessary to remove the cable that shows in the figure below. This cable is supplied for local connection.



4.3.1. Remote communication via external modem

1. Connect the communications card with Ethernet connection to one of the recharging stations located at one end of the installation in order to start the communication ring. It can be connected both with the J15 and J17 connectors, as well as the J16 and J18 connectors.

Remove the end of line jumper from the control card and connect the recharging station to the next station of the communication ring (dark grey cable in the figure below).

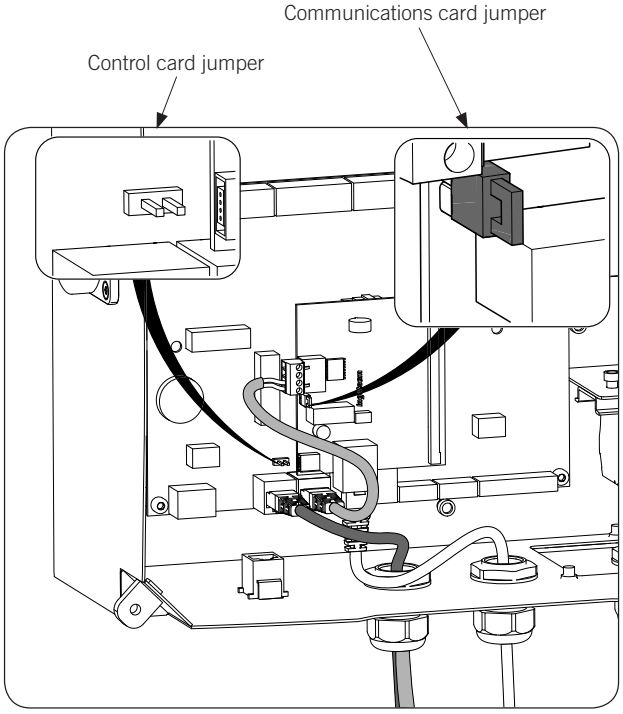


2. Connect the wiring that joins the control card to the communications card (see the dark grey cabling in the following figure).

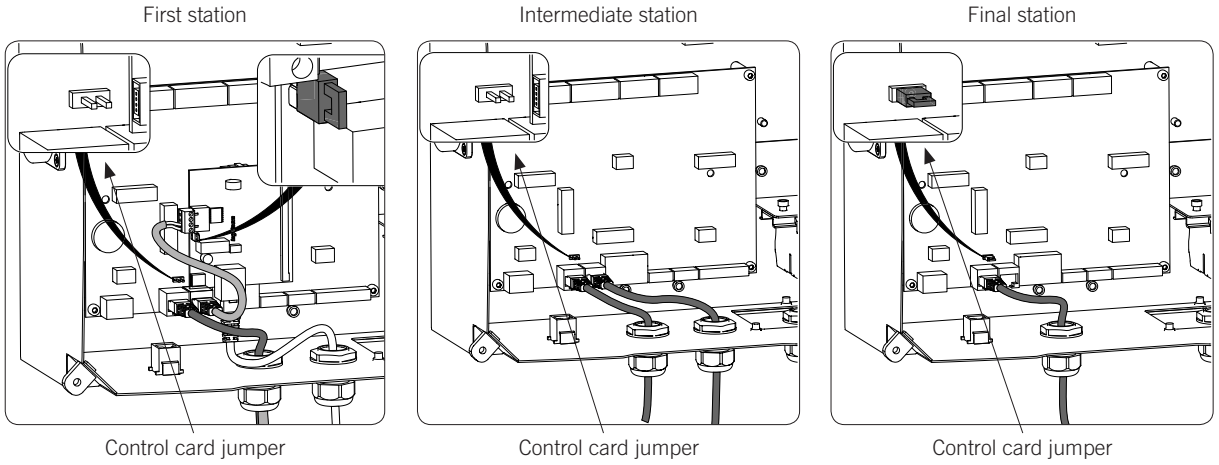
Pin	Colour	Signal
1	White/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

Connect the modem to the communications card (see the white cable in the figure below).

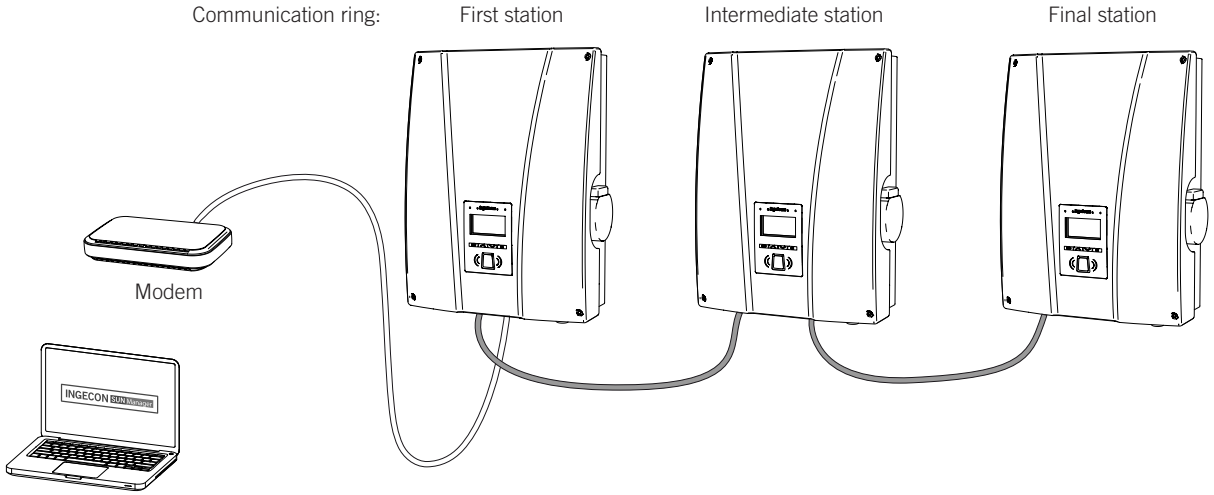
The jumper of the communications card must remain in place.



3. Connect the rest of the recharging stations as shown in the following figures.



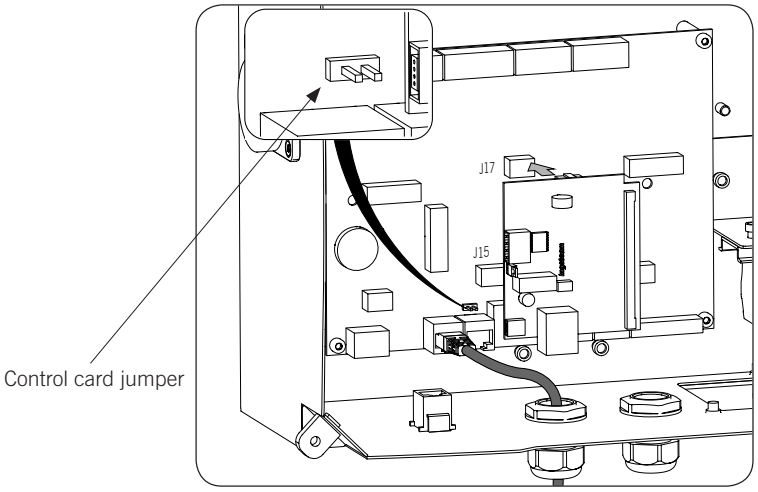
The jumper of the control card must be removed in all the stations except for the final station on the communication ring, where it must be installed.



A maximum of 10 units can be interconnected.

4.3.2. GPRS/3G remote communication via USB modem

1. Connect the communications card to one of the recharging stations located at one end of the installation in order to start the communication ring. It can be connected both with the J15 and J17 connectors, as well as the J16 and J18 connectors.



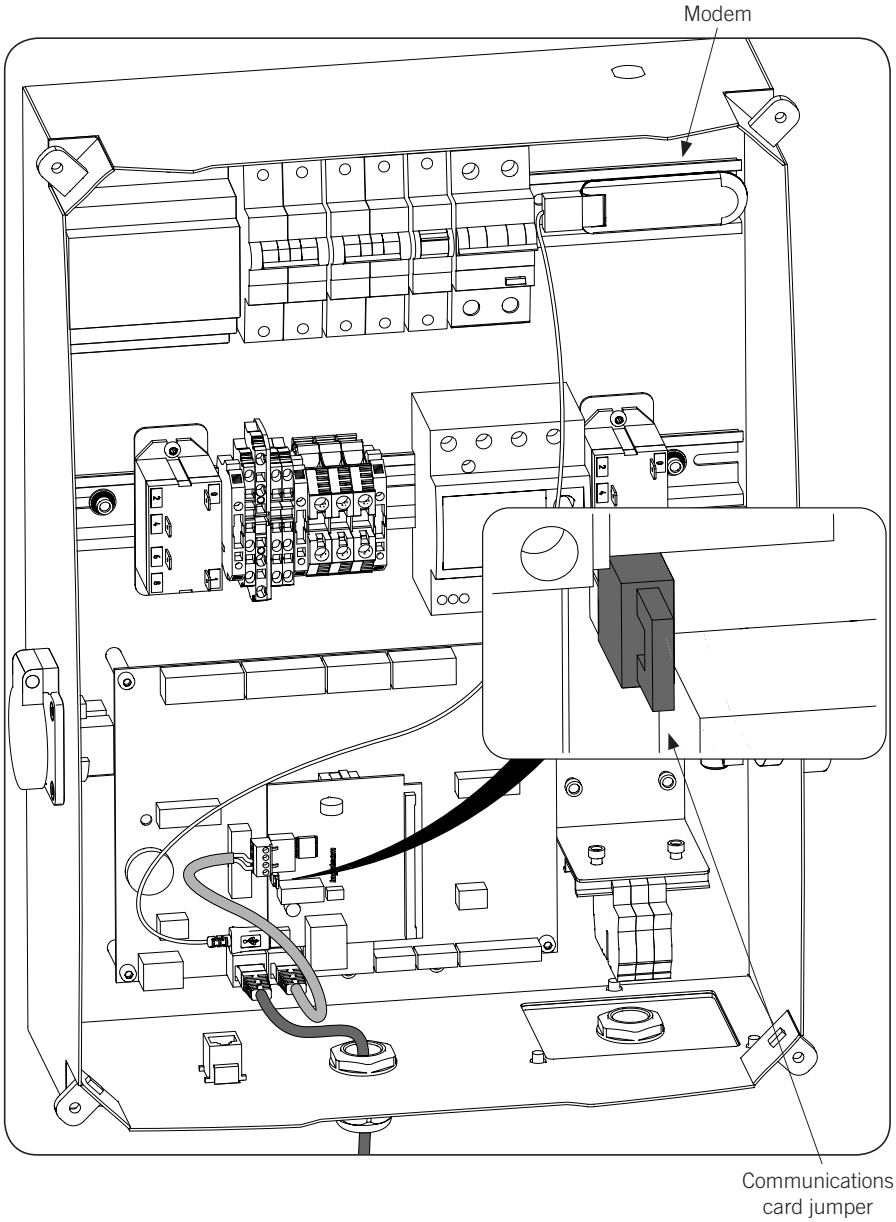
Remove the end of line jumper from the control card and connect the recharging station to the next station of the communication ring (dark grey cable in the previous figure).

2. Connect the wiring that joins the control card to the communications card (see the dark grey cabling in the following figure).

Pin	Colour	Signal
1	White/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

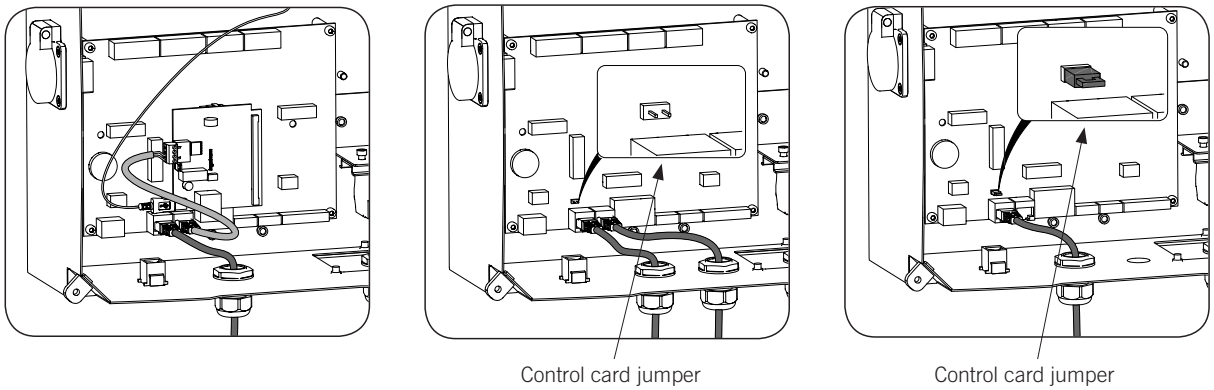
Connect the USB modem to the communications card to obtain the GPRS/3G connection (see the white cable in the figure below).

The jumper of the communications card must remain in place.



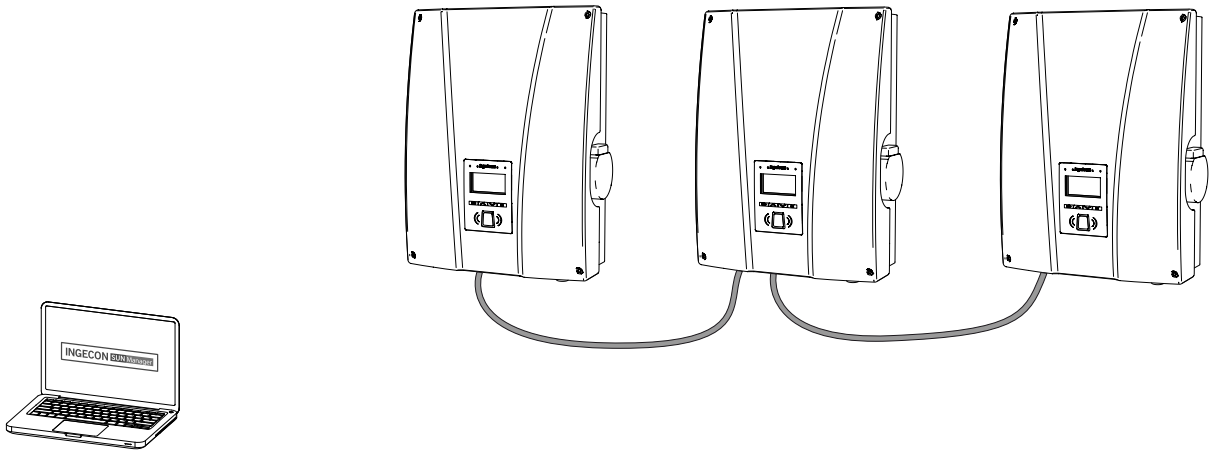
3. Connect the rest of the recharging stations as shown in the following figures.

First station Intermediate station Final station



The jumper of the control card must be removed in all the stations except for the final station on the communication ring, where it must be installed.

Communication ring: First station Intermediate station Final station

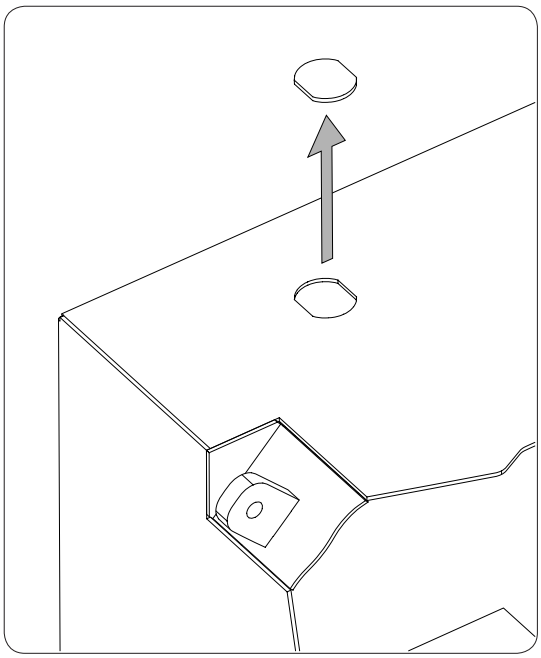


A maximum of 10 units can be interconnected.

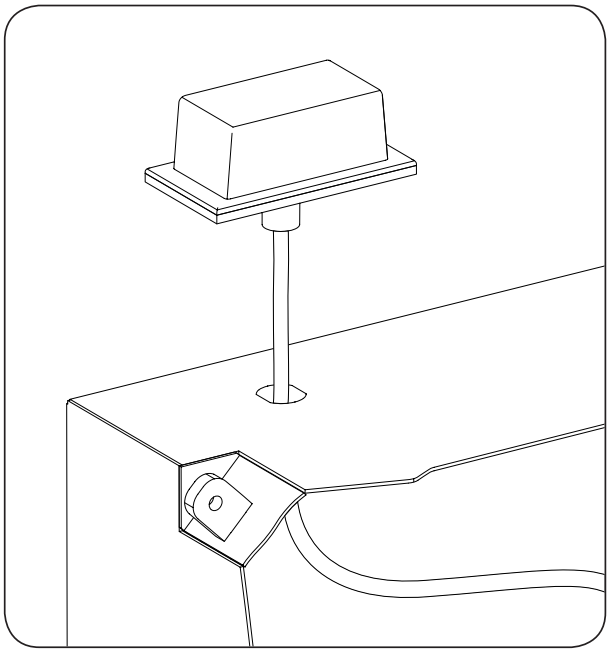
Antenna for USB modem

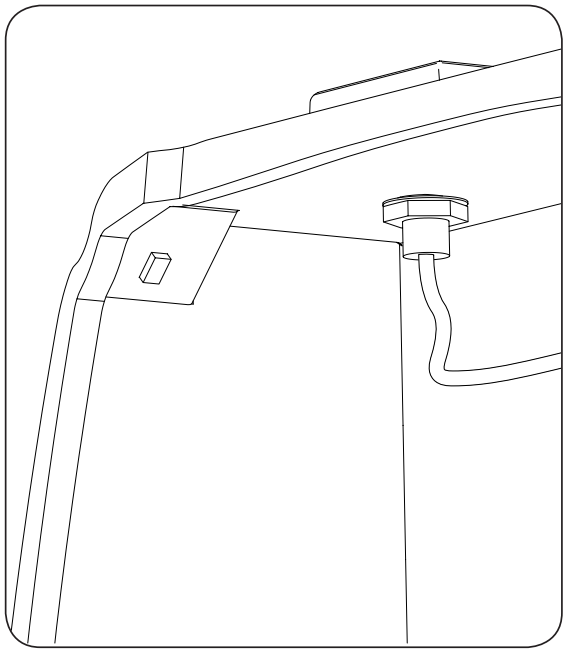
Optionally, an exterior antenna can be requested to boost the modem signal. The connection process is shown below.

1. Punch out the pre-cut hole from the top part of the station.



2. Thread the antenna wiring through the hole and attach the antenna to the station using the nut supplied.





3. Connect the modem antenna cabling.

5. INGEREV CITY

5.1. Local communication

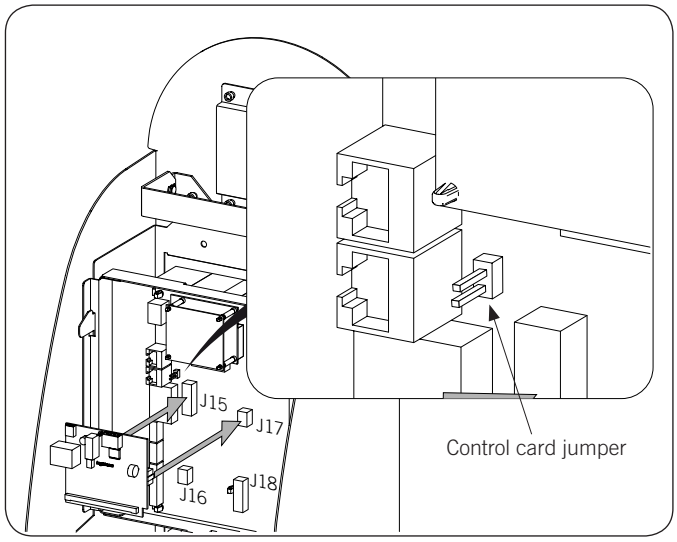
INGEREV CITY recharging stations have a local RS-485 data bus that enables interconnection between the stations. Consult the corresponding installation manual for more information on this subject.

5.2. Remote communication

5.2.1. Remote communication via external modem

1. Connect the communications card with Ethernet connection to one of the recharging stations located at one end of the installation in order to start the communication ring. It can be connected both with the J15 and J17 connectors, as well as the J16 and J18 connectors.

Remove the end of line jumper from the control card:



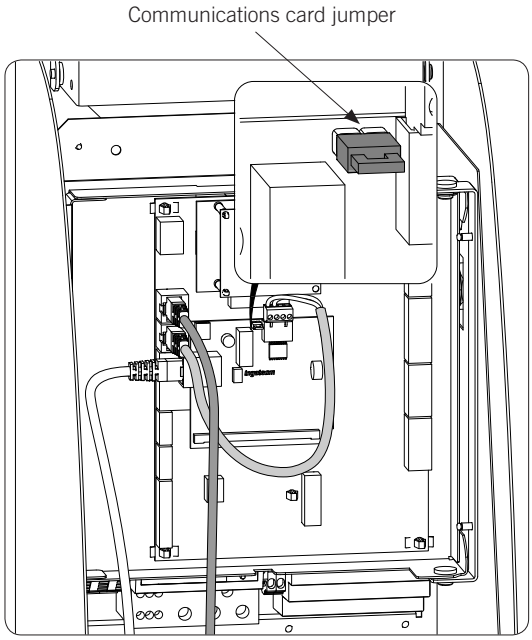
2. Connect the wiring that joins the control card to the communications card (see the dark grey cabling in the following figure).

Pin	Colour	Signal
1	White/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

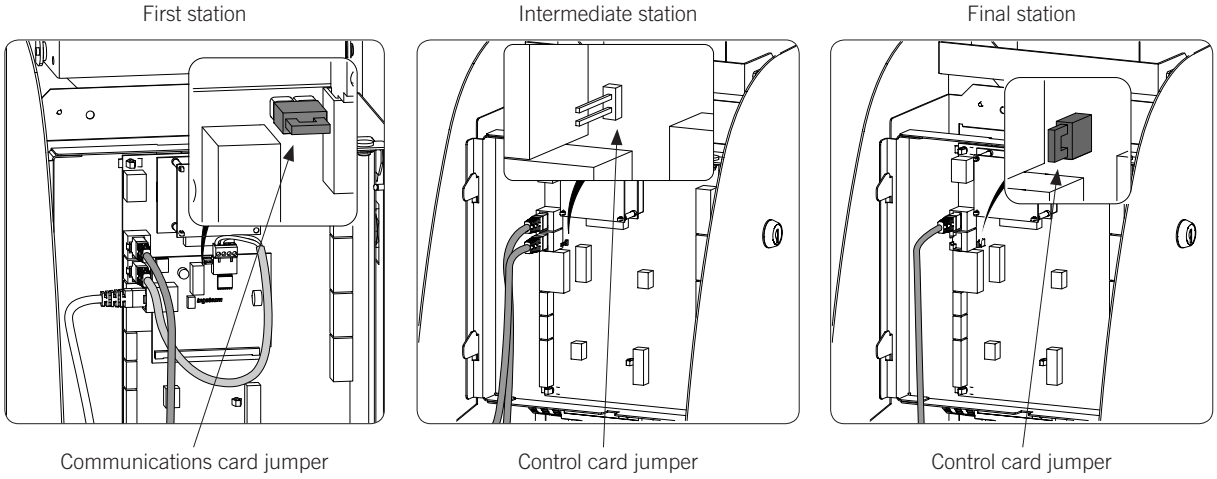
Connect the modem to the communications card (see the white cable in the figure below).

At the free RJ45 connector, connect the station to the next station on the communication ring (see dark grey cable in the figure below).

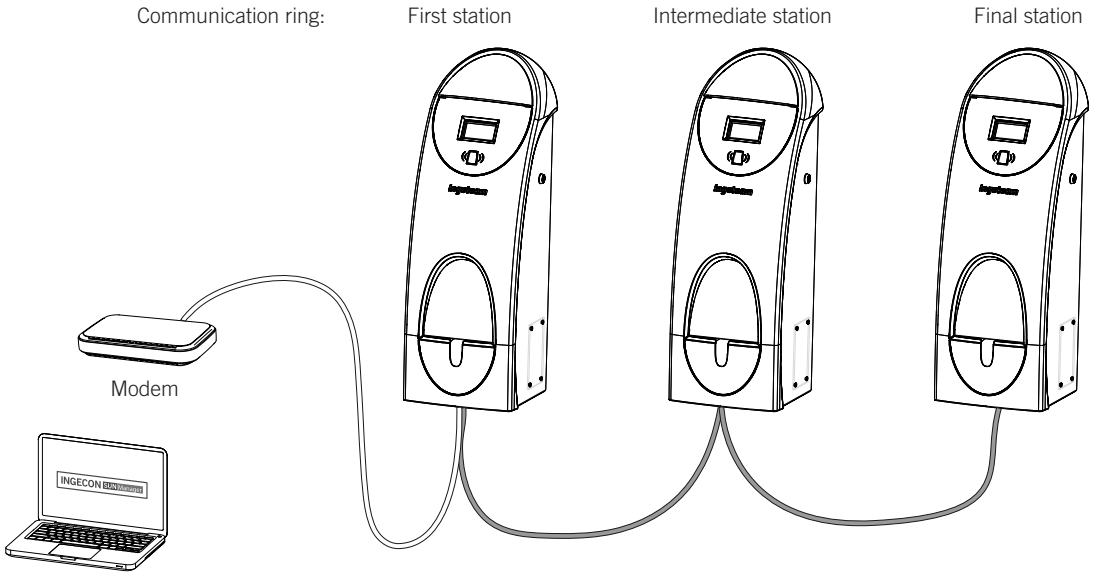
The jumper of the communications card must remain in place.



3. Connect the rest of the recharging stations as shown in the following figures.



The jumper of the control card must be removed in all the stations except for the final station on the communication ring, where it must be installed.

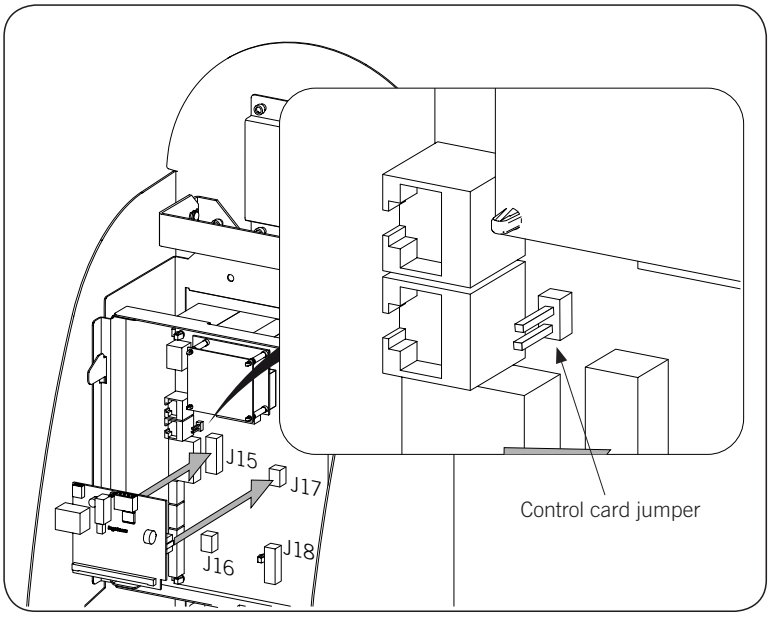


A maximum of 10 units can be interconnected.

5.2.2. GPRS/3G remote communication via USB modem

1. Connect the communications card to one of the recharging stations located at one end of the installation in order to start the communication ring. It can be connected both with the J15 and J17 connectors, as well as the J16 and J18 connectors.

   Remove the end of line jumper from the control card:



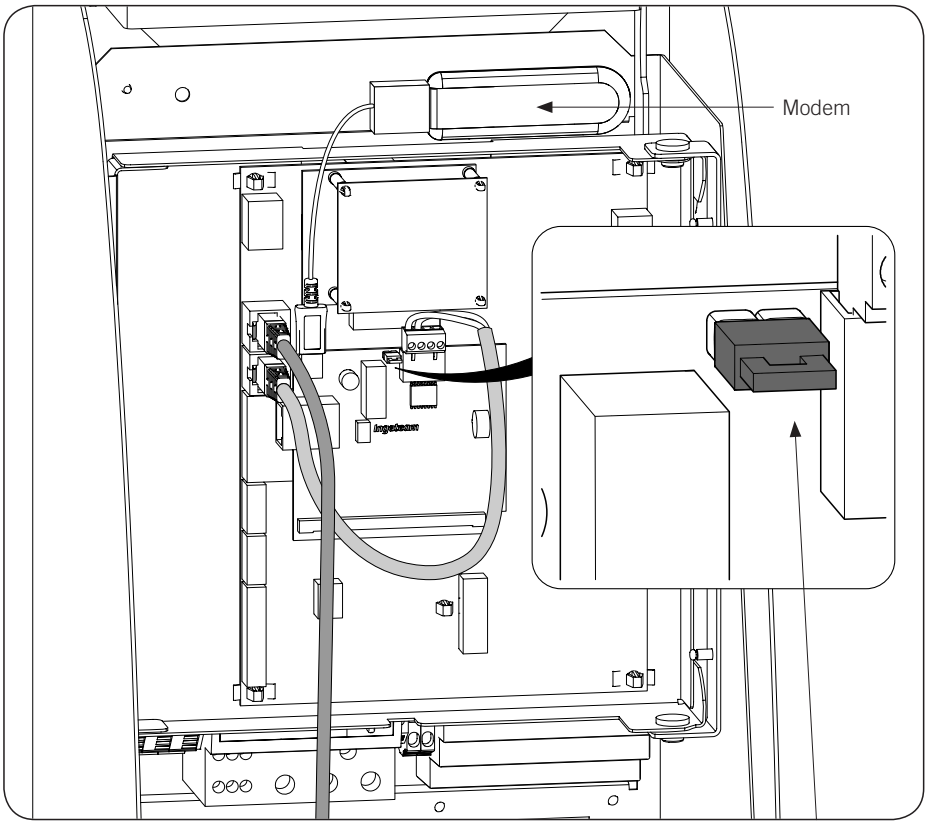
2. Connect the wiring that joins the control card to the communications card (see the dark grey cabling in the following figure).

Pin	Colour	Signal
1	White/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

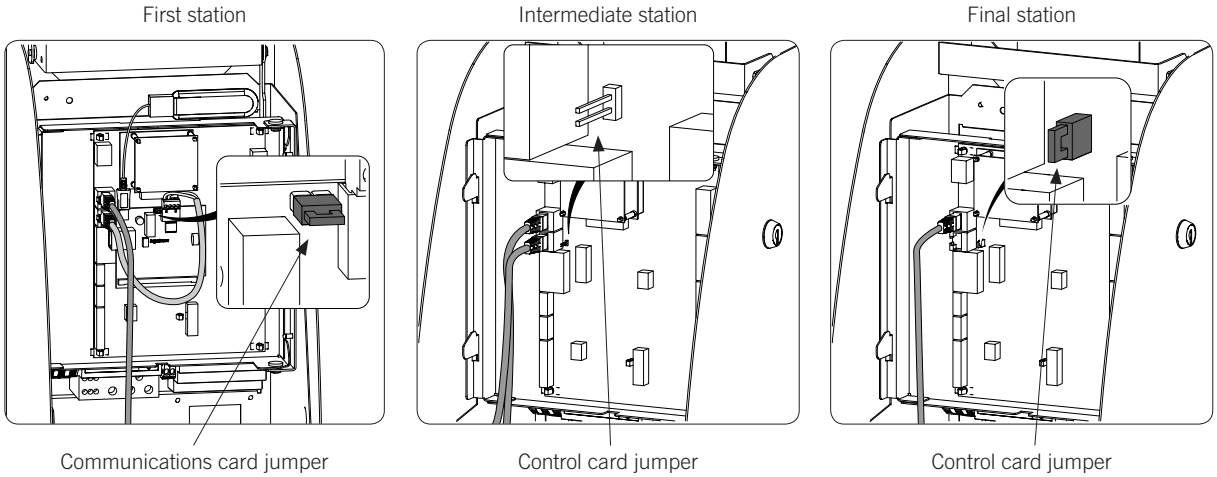
Connect the USB modem to the communications card to obtain the GPRS/3G connection (see the white cable in the figure below).

At the free RJ45 connector, connect the station to the next station on the communication ring (see dark grey cable in the figure below).

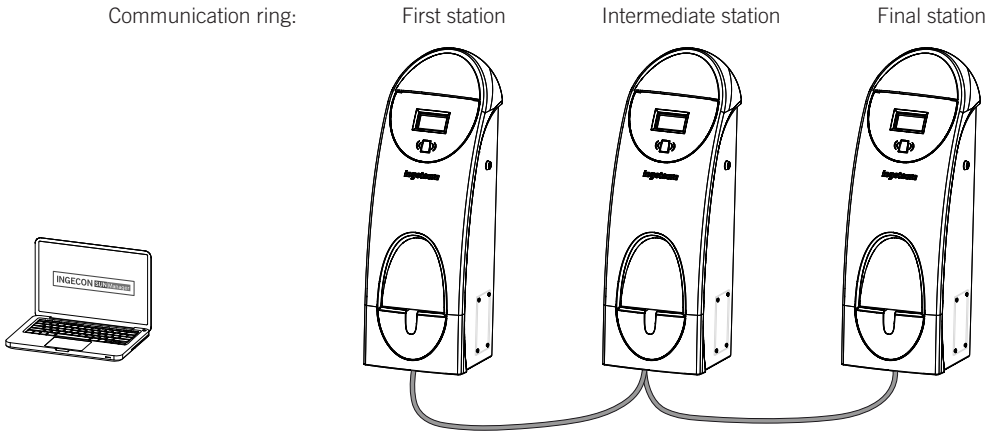
The jumper of the communications card must remain in place.



3. Connect the rest of the recharging stations as shown in the following figures.



The jumper of the control card must be removed in all the stations except for the final station on the communication ring, where it must be installed.



A maximum of 10 units can be interconnected.

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1. Información sobre este manual

El propósito de este manual es describir la comunicación en las estaciones de recarga INGEREV. El acceso a todas las estaciones de recarga podrá ser de forma local o remota, utilizando en este último caso un módem externo propio de la instalación o mediante un módem USB si así se ha solicitado al efectuar el pedido.

La configuración y monitorización de todas las estaciones se realizará mediante el software INGECON SUN Manager, proporcionado por Ingeteam.

1.1. Campo de aplicación

Este manual es válido para todos los modelos de las siguientes familias INGEREV:

INGEREV GARAGE Basic

INGEREV GARAGE

INGEREV CITY

1.2. Destinatarios

El presente documento está orientado a personal cualificado.

La condición de personal cualificado a la que se refiere este manual, será como mínimo aquella que satisfaga todas las normas, reglamentos y leyes en materia de seguridad aplicables a los trabajos de instalación y operación de todos los elementos de la instalación.

La realización de cualquiera de las operaciones por personal no autorizado por Ingeteam puede suponer la pérdida de la garantía original del equipo.

La responsabilidad de designar al personal cualificado siempre recaerá sobre la empresa a la que pertenezca este personal, debiendo decidir qué trabajador es apto o no para realizar uno u otro trabajo para preservar su seguridad a la vez que se cumple la legislación de seguridad en el trabajo.

Dichas empresas son responsables de proporcionar una adecuada formación en equipos eléctricos a su personal, y a familiarizarlo con el contenido de este manual.

1.3. Simbología

A lo largo de este manual se utilizarán diferentes símbolos con el fin de remarcar y resaltar ciertos textos. A continuación se explican los significados generales de estos.

Atención general.

Leer el apartado indicado.

Riesgo eléctrico.

Prohibición.

2. Seguridad

A lo largo de este apartado se detallan los avisos de seguridad así como el Equipo de Protección Individual.

2.1. Condiciones de seguridad

Avisos generales

Las operaciones detalladas en el manual sólo pueden ser realizadas por personal cualificado.

La condición de personal cualificado a la que se refiere este manual, será como mínimo aquella que satisfaga todas las normas, reglamentos y leyes en materia de seguridad aplicables a los trabajos de instalación y operación de este equipo.

Se recuerda que es obligatorio cumplir toda la legislación aplicable en materia de seguridad para el trabajo eléctrico. Existe peligro de descarga eléctrica.

El cumplimiento de las instrucciones de seguridad expuestas en este manual o de la legislación sugerida no exime del cumplimiento de otras normas específicas de la instalación, el lugar, el país u otras circunstancias que afecten al equipo.

La apertura de la envolvente no implica la ausencia de tensión en su interior.

Existe peligro de descarga eléctrica incluso después de desconectar todas las fuentes de energía del sistema.

Sólo podrá abrirla personal cualificado siguiendo las instrucciones de este manual.

Es obligatorio leer y entender el manual por completo antes de comenzar a manipular, instalar u operar el equipo.

La normativa de seguridad básica de obligado cumplimiento para cada país es:

- *RD 614/2001* en España.
- *CEI 11-27* en Italia.
- *DIN VDE 0105-100* y *DIN VDE 1000-10* en Alemania.
- *UTE C18-510* en Francia.

Es obligatorio para comprobar ausencia de tensión utilizar elementos de medida de categoría III-1000 Voltios.

Ingeteam no se responsabiliza de los daños que pudieran causarse por una utilización inadecuada de los equipos. Toda intervención que se realice sobre cualquiera de estos equipos que suponga un cambio en las disposiciones eléctricas respecto a las originales deberán ser previamente propuestas a Ingeteam. Éstas deberán ser estudiadas y aprobadas por Ingeteam.

Realizar todas las maniobras y manipulaciones sin tensión.

Como medida mínima de seguridad en esta operación, se deberán observar las llamadas **5 reglas de oro**:

1. Desconectar.
2. Prevenir cualquier posible realimentación.
3. Verificar la ausencia de tensión.
4. Poner a tierra y en cortocircuito.
5. Proteger frente a elementos próximos en tensión, en su caso, y establecer una señalización de seguridad para delimitar la zona de trabajo.

Hasta que no se hayan completado las cinco etapas, no podrá autorizarse el trabajo sin tensión y se considerará trabajo en tensión en la parte afectada.

Peligros potenciales para el equipo

Se han de tener en cuenta los siguientes avisos con el fin de proteger el equipo.

Después de toda manipulación debidamente autorizada, comprobar que el equipo está preparado para empezar a funcionar. Sólo después se puede proceder a conectarlo siguiendo las instrucciones del manual.

No tocar tarjetas ni componentes electrónicos. Los componentes más sensibles pueden dañarse o destruirse por la electricidad estática.

No desconectar o conectar ningún terminal mientras el equipo está funcionando. Desconectar y comprobar la ausencia de tensión antes.

2.2. Equipo de Protección Individual (EPI)

Siempre que se trabaje en el equipo usar, como mínimo, el siguiente equipamiento de seguridad recomendado por Ingeteam.

Denominación	Explicación
Calzado de seguridad	Conforme a la norma *UNE-EN-ISO 20345:2012*
Casco	Conforme a la norma *EN 397:1995*
Casco con pantalla facial	Conforme a la norma *la UNE-EN 166:2002*, siempre que existan elementos con tensión directamente accesibles
Ropa de trabajo	Ceñida al cuerpo, no inflamable, 100% de algodón
Guantes dieléctricos	Conforme a la norma *EN 60903:2005*

Las herramientas y/o equipos empleados en trabajos en tensión deben poseer, al menos, aislamiento de categoría III-1000 Voltios.

En caso de que normativas propias del lugar exijan otro tipo de equipo de protección individual, el equipo recomendado por Ingeteam se deberá completar adecuadamente.

2.3. Tratamiento de Residuos

Concluida la vida útil de las tarjetas de circuitos impresos éstas deben ser puestas en manos de un Gestor Autorizado para su correcto reciclado.

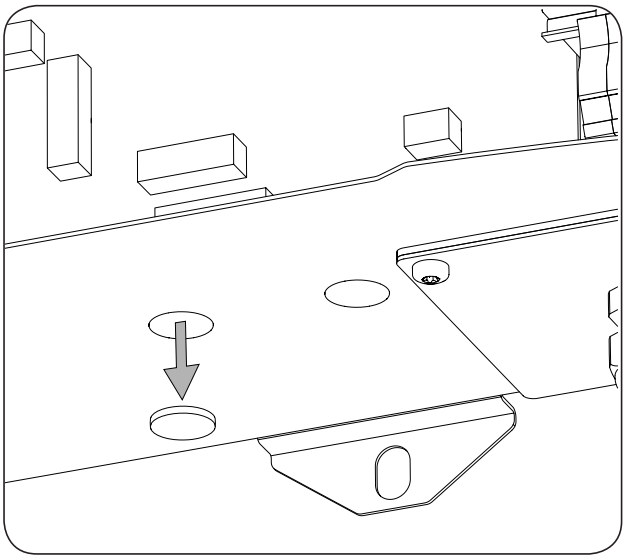
3. INGEREV GARAGE Basic

3.1. Instalación de PGs

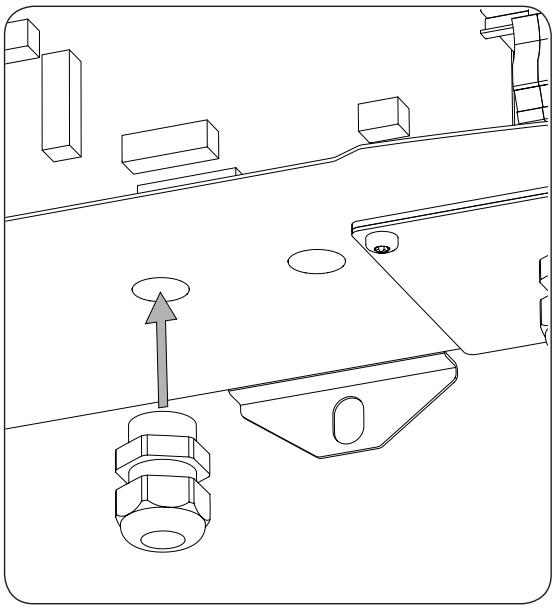
Para la instalación de los accesorios de comunicación en las estaciones de recarga INGEREV GARAGE Basic es necesaria la instalación de PGs para realizar el paso de cables entre estaciones.

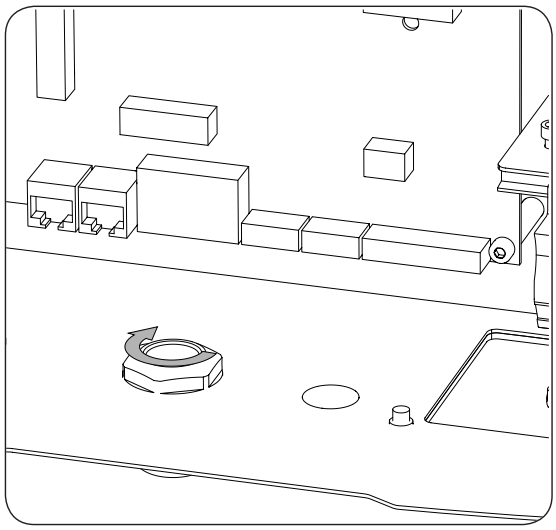
Para instalar los PGs seguir las siguientes instrucciones:

1. Eliminar uno de los precortados de la placa de conexiones inferior.

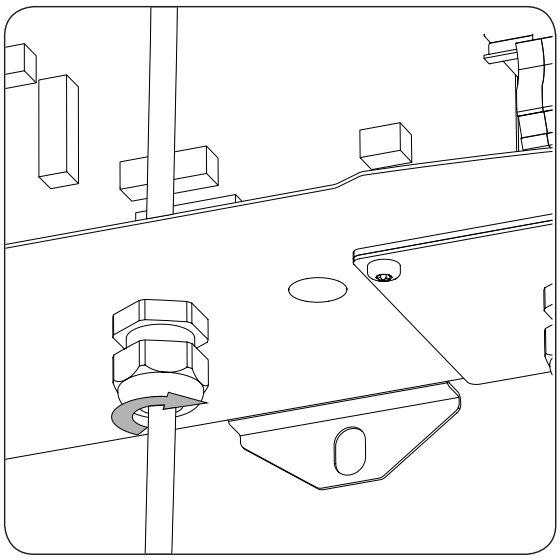


2. Insertar el PG en el orificio y roscar la tuerca.





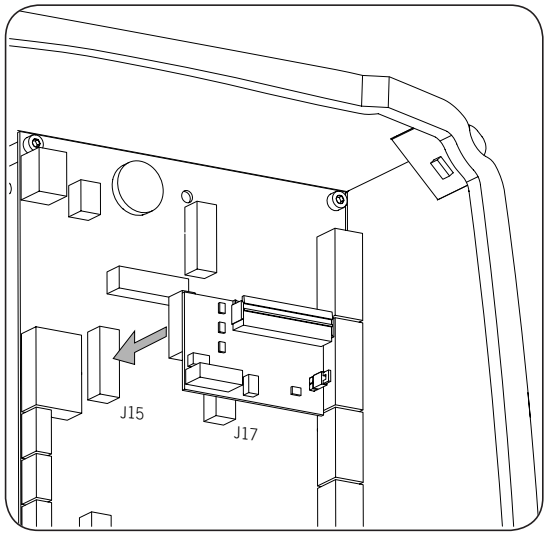
3. Introducir el cableado y apretar el PG. Se deberá dejar cierto margen para que el cableado no esté en tensión.



3.2. Comunicación local

Para realizar la conexión local seguir las siguientes indicaciones:

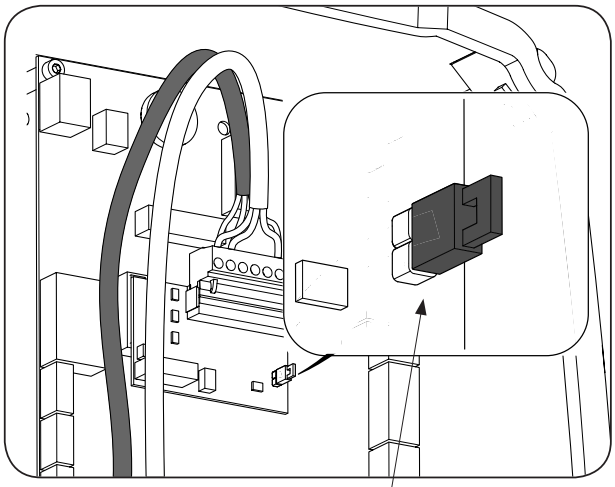
1. Conectar la tarjeta de comunicaciones RS-485 en todas las estaciones de recarga que conforman el anillo de comunicación. Se debe conectar en los conectores J15 y J17.



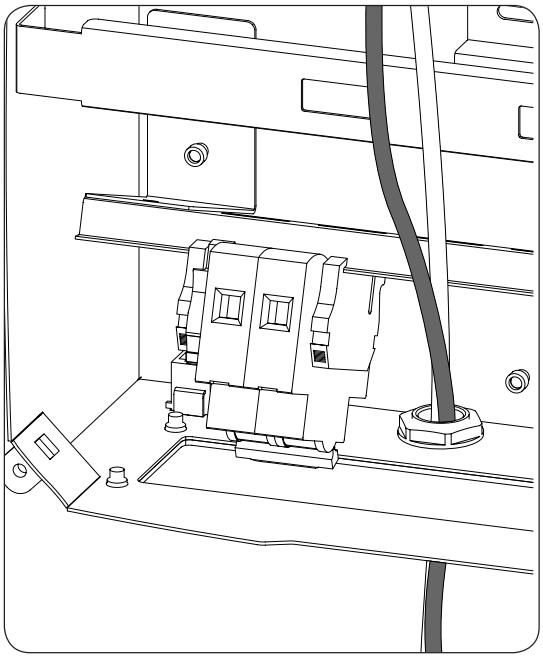
2. Realizar el cableado que une la tarjeta de comunicaciones con la tarjeta de comunicaciones de la siguiente estación de recarga (ver el cable gris oscuro en la siguiente figura).

Pin	Señal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

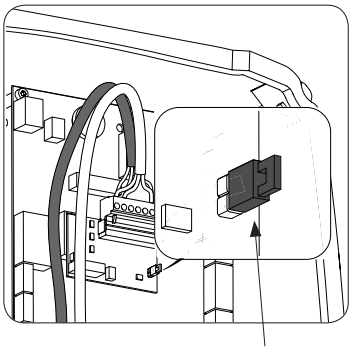
Utilizar un convertidor USB a RS-485 (no suministrado por Ingeteam) para conectar el ordenador a la primera estación del anillo de comunicación (cable blanco en la siguiente figura).



Jumper tarjeta de comunicaciones

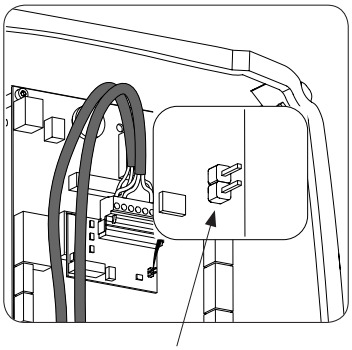


Primera estación



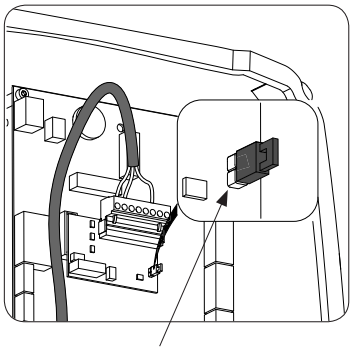
Jumper tarjeta de comunicaciones

Estación intermedia

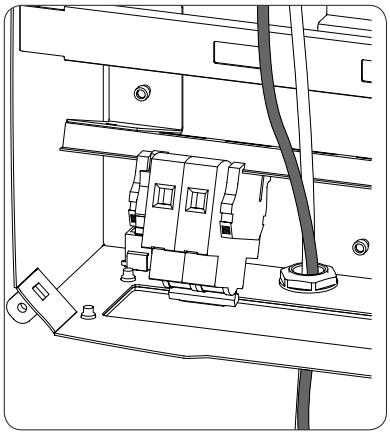


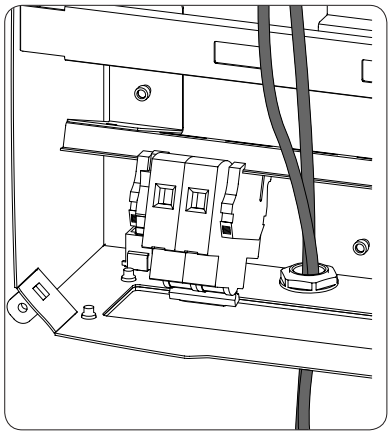
Jumper tarjeta de comunicaciones

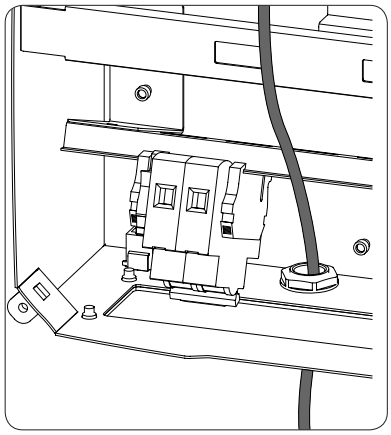
Estación final



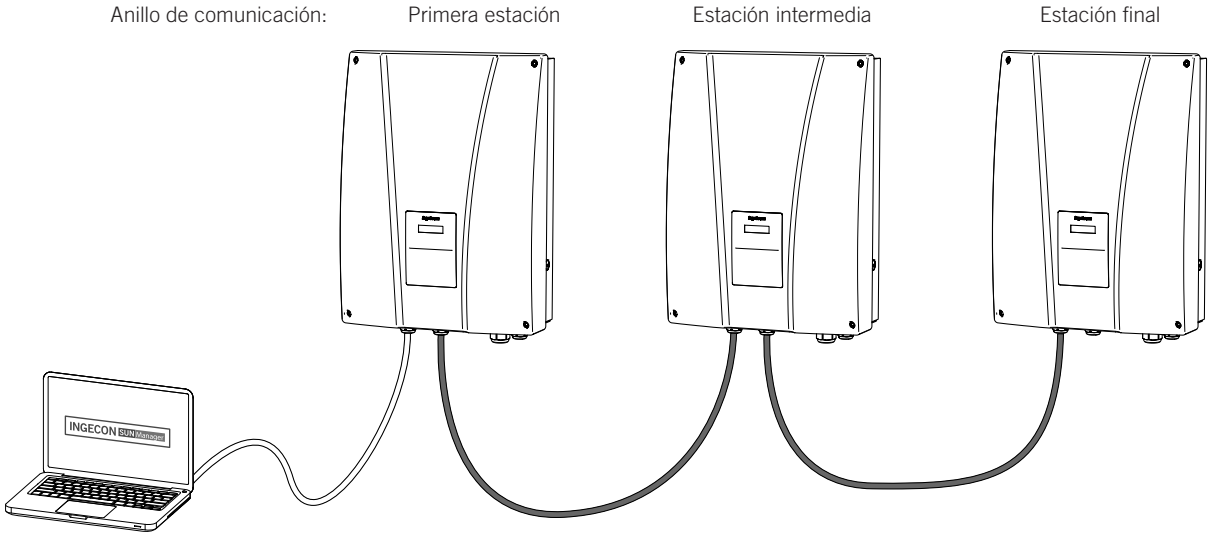
Jumper tarjeta de comunicaciones







El jumper de las tarjetas RS-485 deberá estar desinstalado en todas las estaciones intermedias del anillo de comunicación.

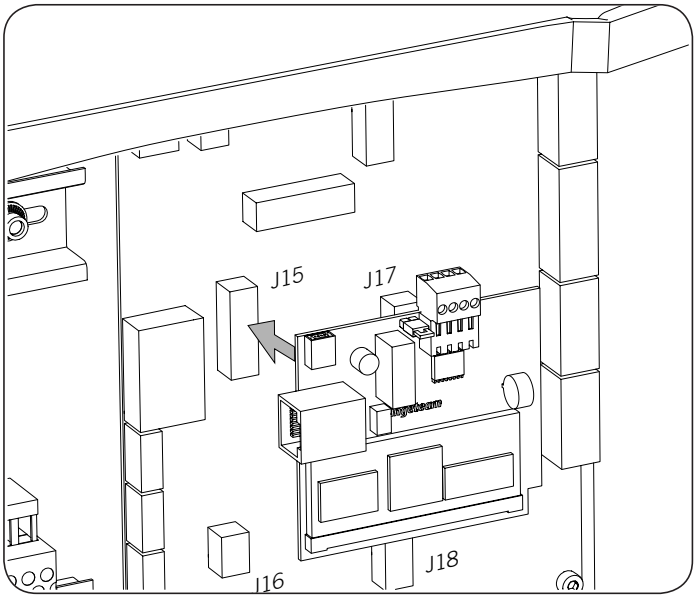


Podrán conectarse un máximo de 10 equipos entre sí.

3.3. Comunicación remota

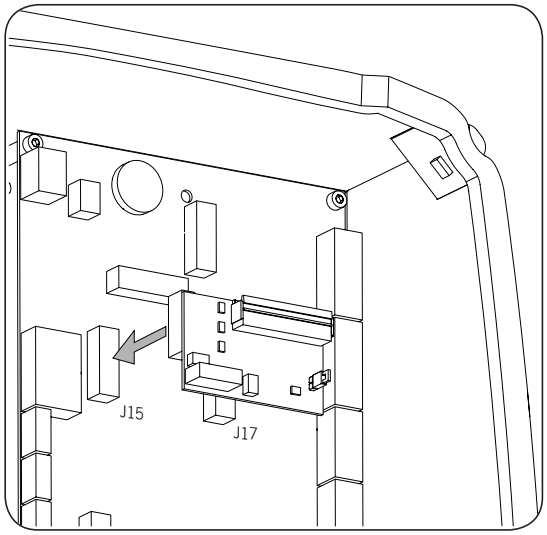
3.3.1. Comunicación remota mediante módem externo

1. Conectar la tarjeta de comunicaciones con conexión Ethernet en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se debe conectar en los conectores J15 y J17.



Pin	Señal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Instalar las tarjetas de comunicaciones RS-485 en el resto de estaciones de recarga que conforman el anillo de comunicación. Se deben conectar en los conectores J15 y J17.

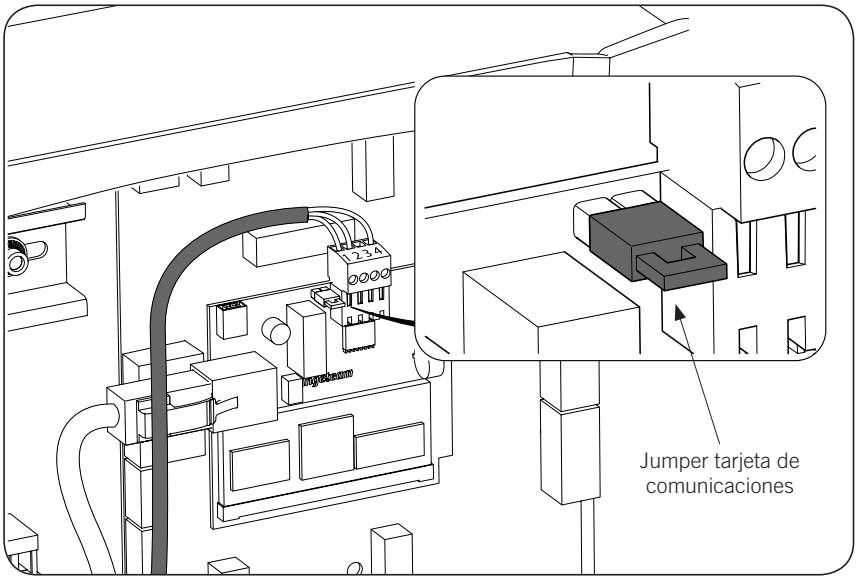


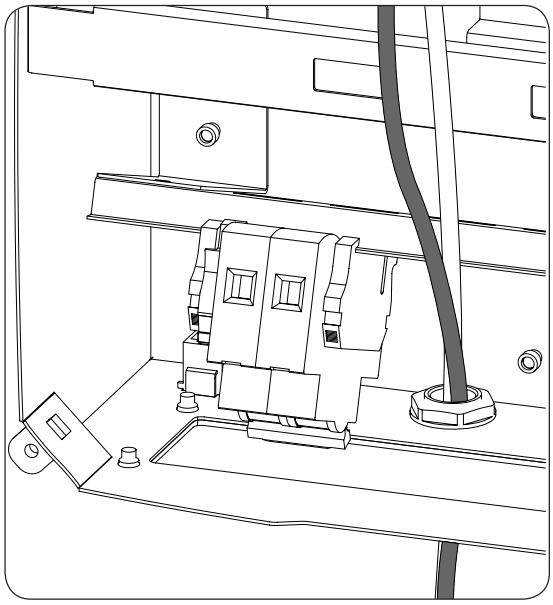
Pin	Señal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

3. Realizar el cableado que une la tarjeta de comunicaciones con la tarjeta de comunicaciones de la siguiente estación de recarga (ver el cable gris oscuro en la siguiente figura).

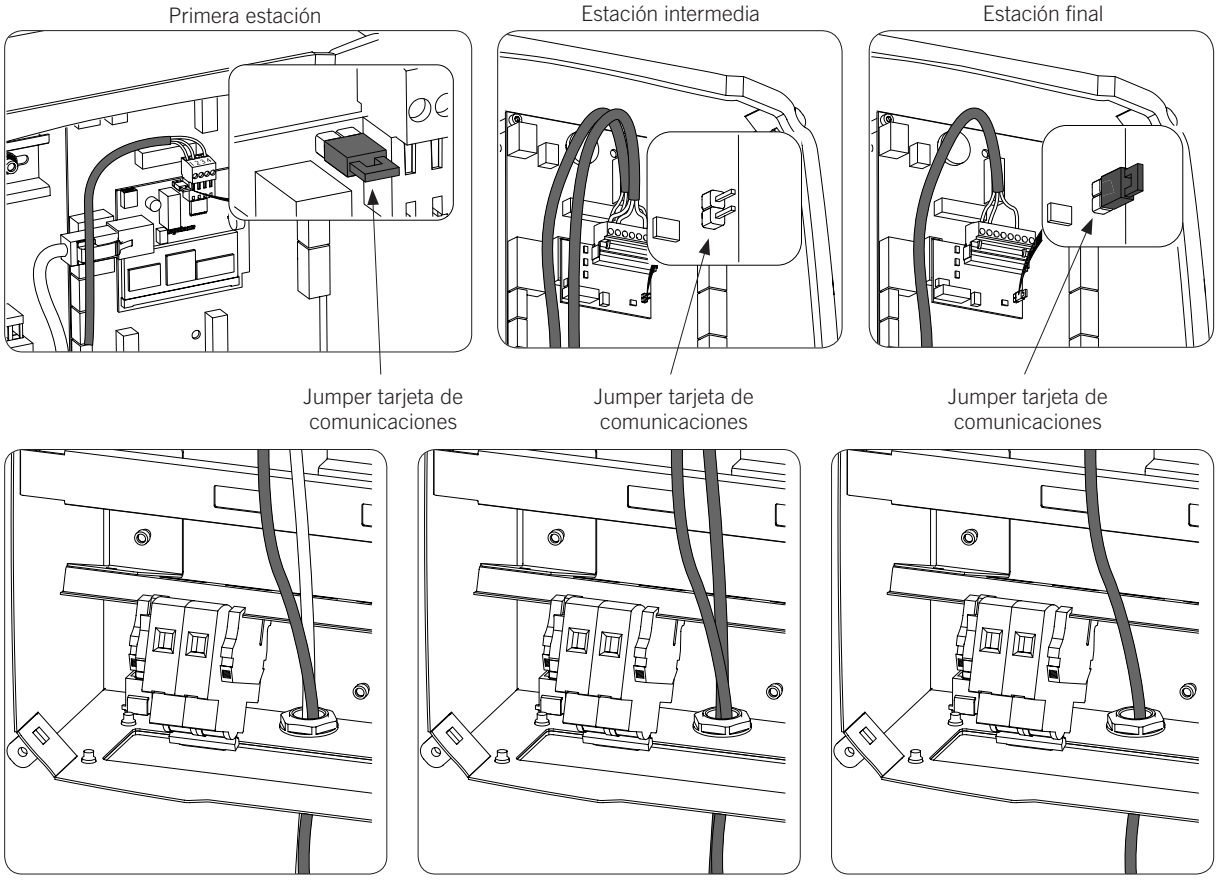
Conectar el módem a la tarjeta de comunicaciones de la primera estación de recarga (ver el cable blanco en la siguiente figura).

El jumper de la tarjeta de comunicaciones de la primera estación de recarga deberá permanecer instalado.

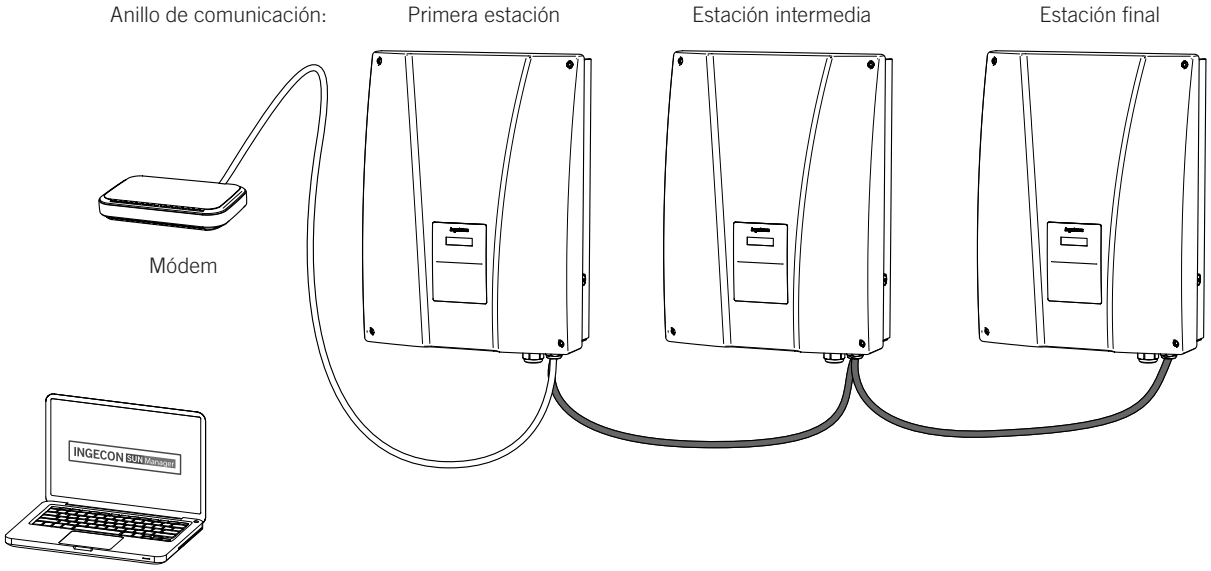




4. Conectar el resto de estaciones de recarga del anillo de comunicaciones tal y como se indica en las siguientes figuras.



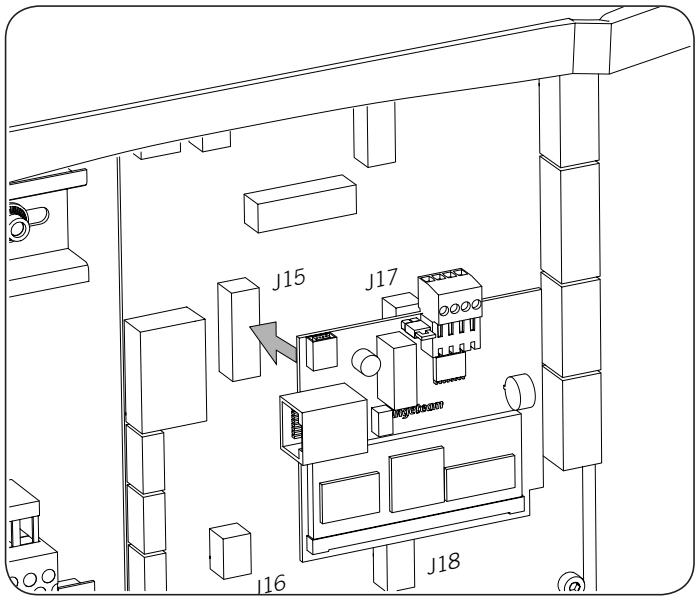
El jumper de las tarjetas RS-485 deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.



Podrán conectarse un máximo de 10 equipos entre sí.

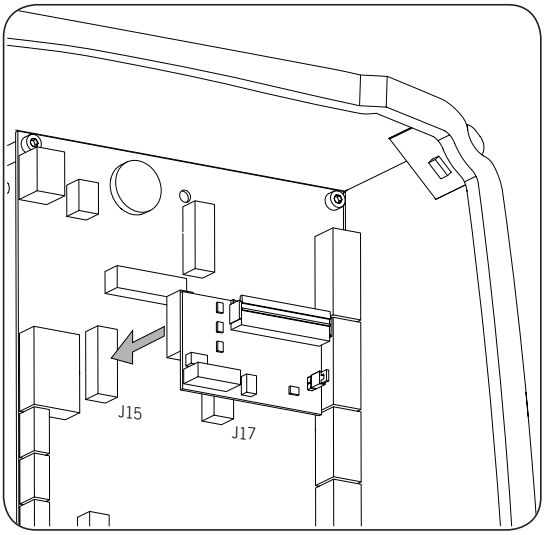
3.3.2. Comunicación remota GPRS/3G mediante módem USB

1. Conectar la tarjeta de comunicaciones que irá conectada al módem USB en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se debe conectar en los conectores J15 y J17.



Pin	Señal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Instalar las tarjetas de comunicaciones RS-485 en el resto de estaciones de recarga que conforman el anillo de comunicación. Se deben conectar en los conectores J15 y J17.

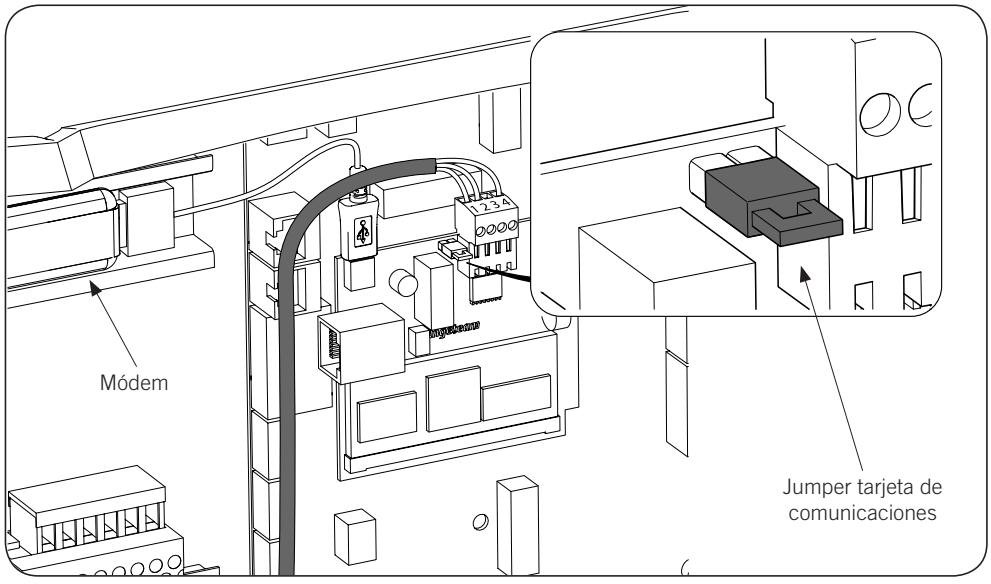


Pin	Señal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

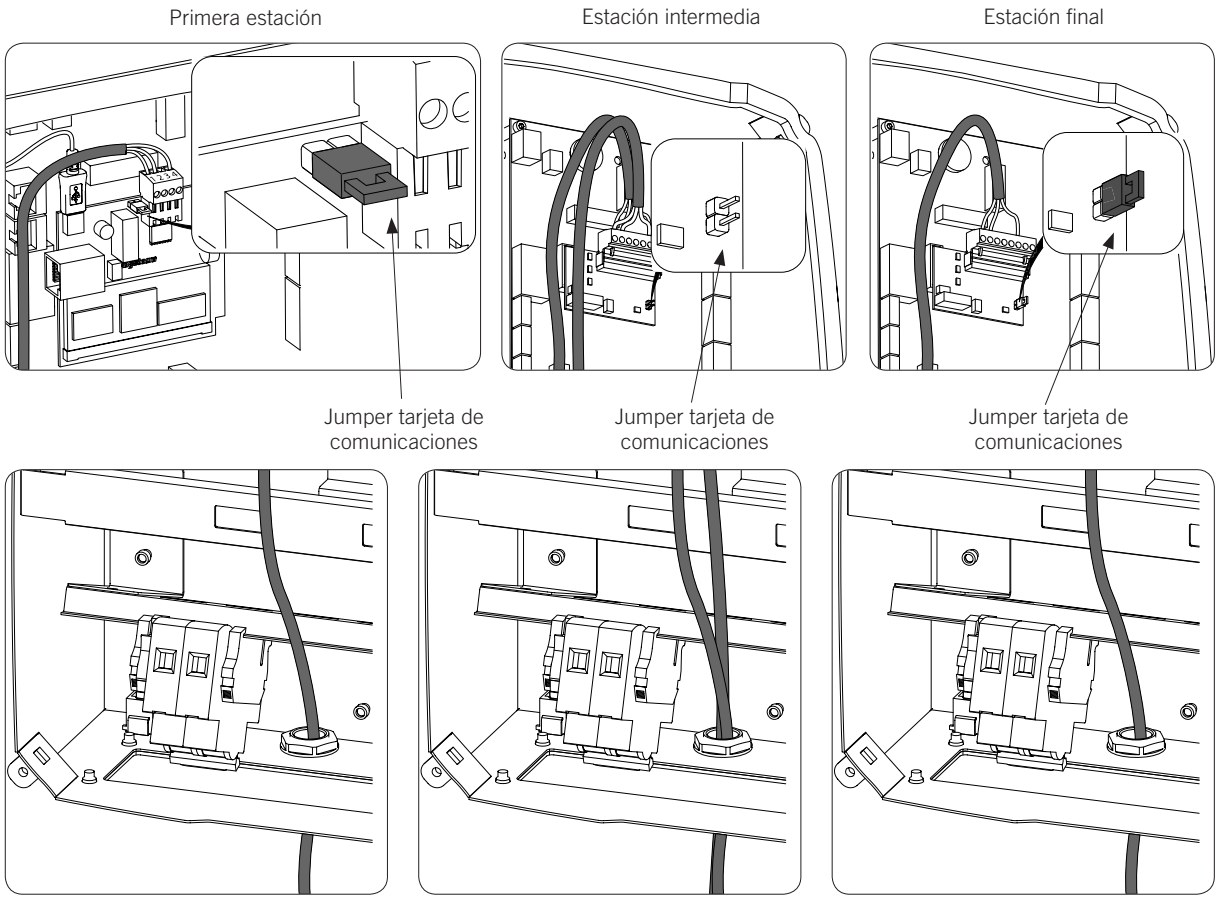
3. Realizar el cableado que une la tarjeta de comunicaciones con la tarjeta de comunicaciones de la siguiente estación de recarga (ver el cable gris oscuro en la siguiente figura).

Conectar el módem USB a la tarjeta de comunicaciones de la primera estación de recarga para obtener conexión GPRS/3G.

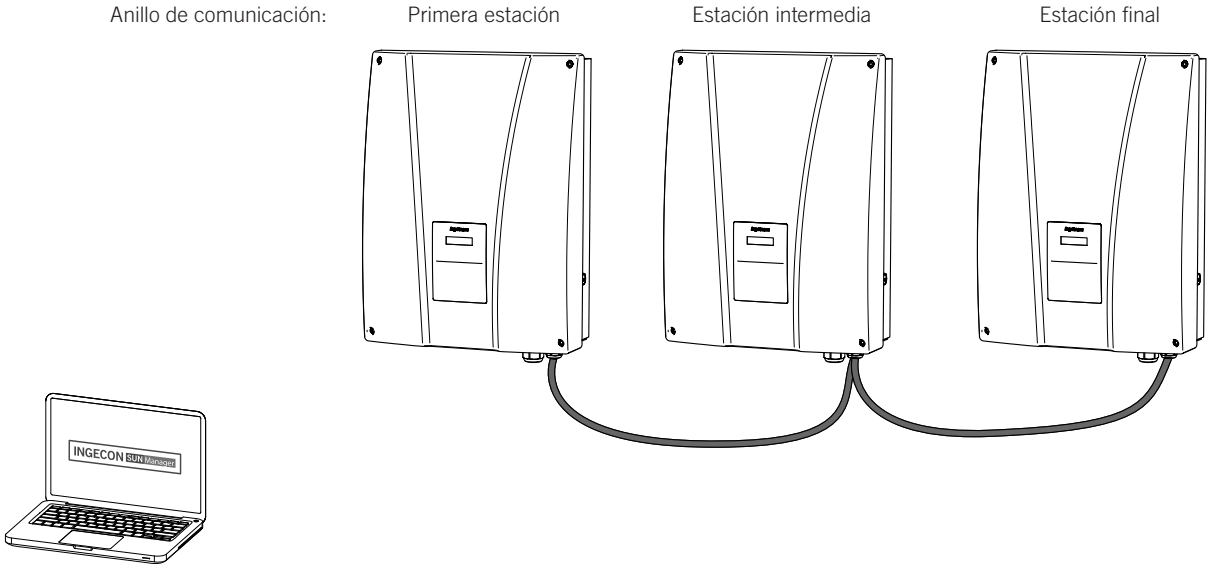
El jumper de la tarjeta de comunicaciones de la primera estación de recarga deberá permanecer instalado.



4. Conectar el resto de estaciones de recarga tal y como se indica en las siguientes figuras:



El jumper de las tarjetas RS-485 deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.

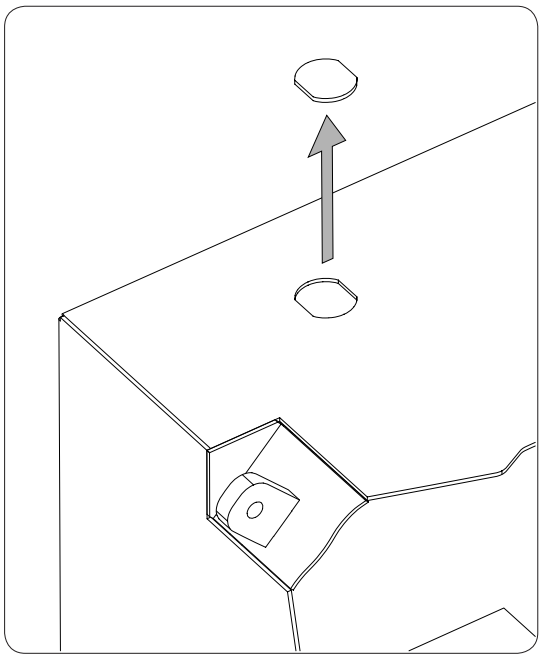


Podrán conectarse un máximo de 10 equipos entre sí.

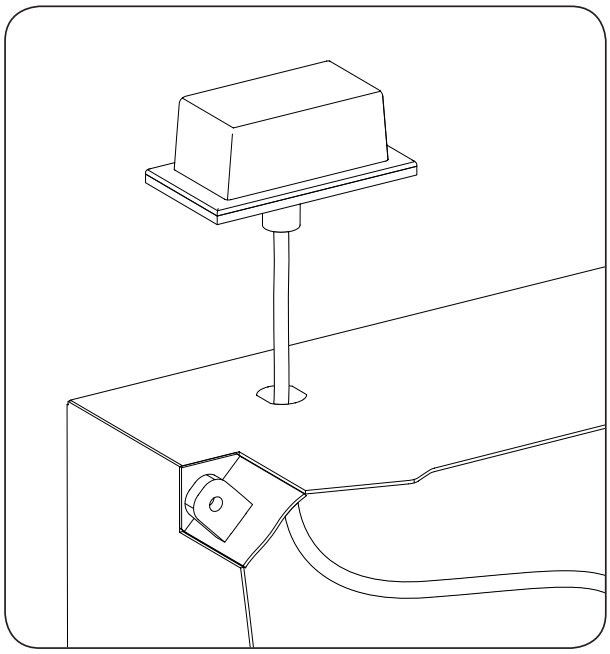
Antena para módem USB

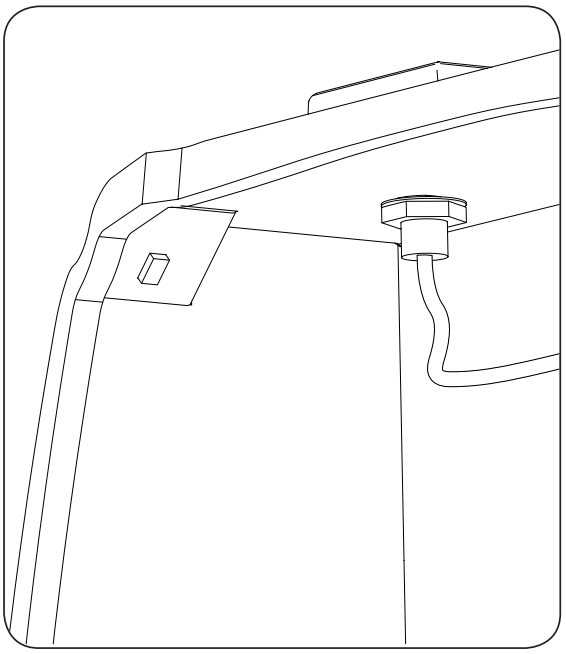
Opcionalmente se puede solicitar una antena exterior para ampliar la señal del módem. A continuación se muestra el proceso de conexión.

1. Eliminar el precortado de la parte superior de la estación.



2. Introducir el cableado de la antena a través del orificio y fijar la antena a la estación mediante la tuerca suministrada.





3. Conectar el cableado de la antena al módem.

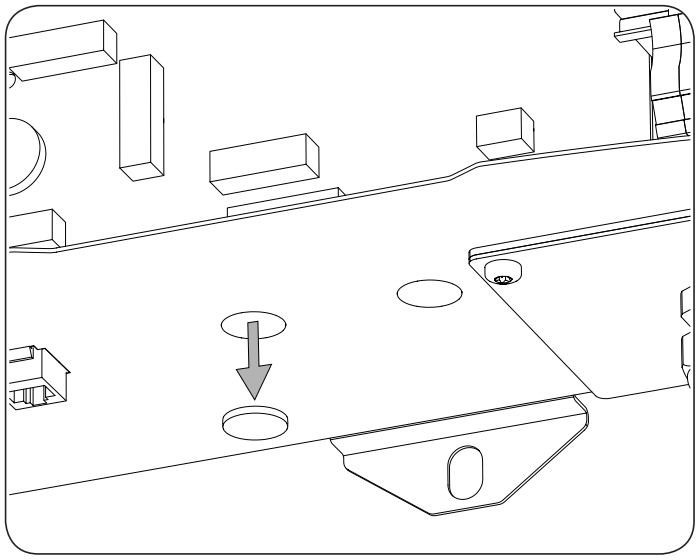
4. INGEREV GARAGE

4.1. Instalación de PGs

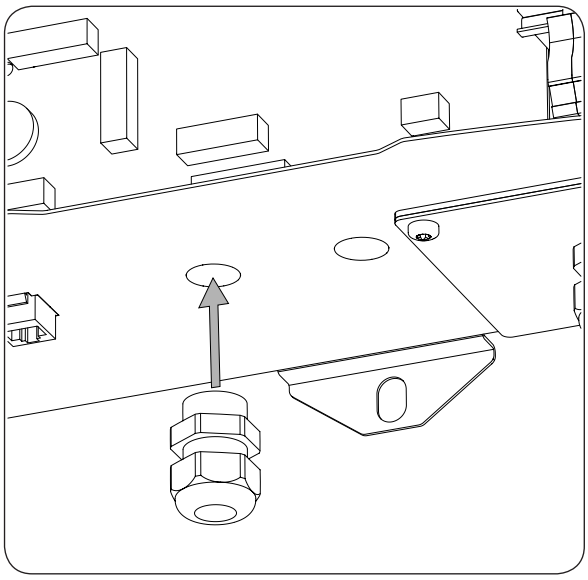
Para la instalación de los accesorios de comunicación en las estaciones de recarga INGEREV GARAGE es necesaria la instalación de PGs para realizar el paso de cables entre estaciones.

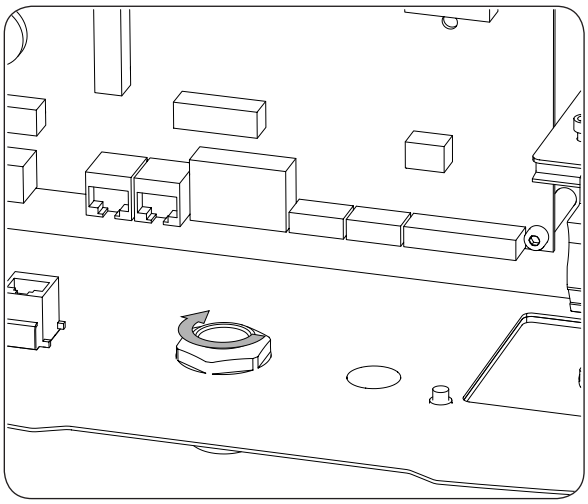
Para instalar los PGs seguir las siguientes instrucciones:

1. Eliminar uno de los precortados de la placa de conexiones inferior.

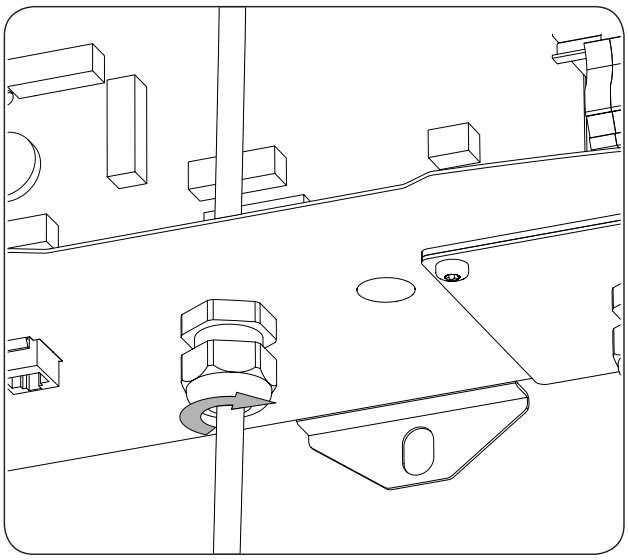


2. Insertar el PG en el orificio y roscar la tuerca.





3. Introducir el cableado y apretar el PG. Se deberá dejar cierto margen para que el cableado no esté en tensión.

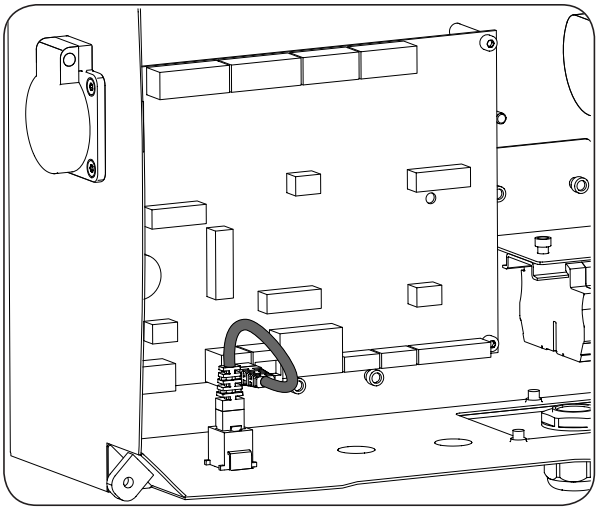


4.2. Comunicación local

Las estaciones de recarga INGEREV GARAGE incorporan un bus de datos RS-485 local con conector RJ45 que permite la conexión entre diferentes estaciones. Consultar el manual de instalación correspondiente para ampliar esta información.

4.3. Comunicación remota

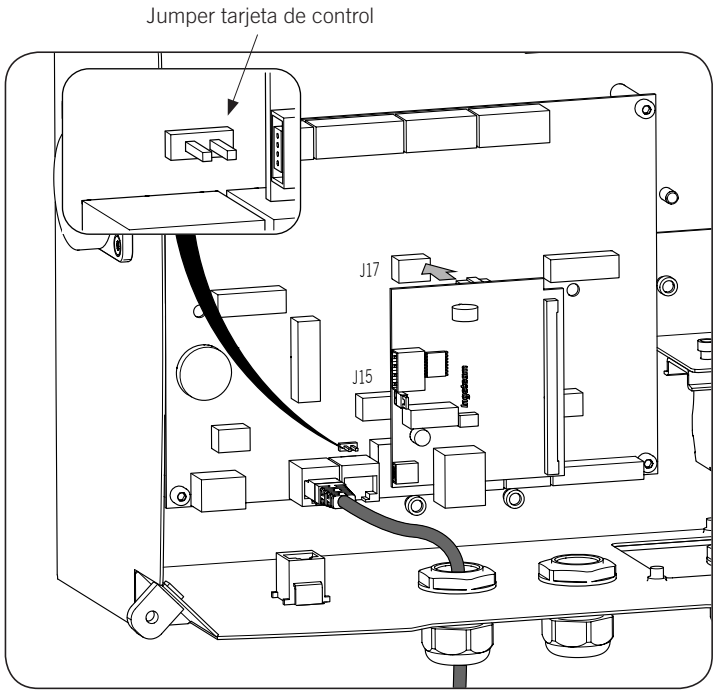
Para realizar comunicación remota vía Ethernet o mediante módem USB en las estaciones de recarga INGEREV GARAGE es necesario quitar el cable que se muestra en la siguiente figura. Este cable se incluye para la comunicación local.



4.3.1. Comunicación remota mediante módem externo

1. Conectar la tarjeta de comunicaciones con conexión Ethernet en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se puede conectar tanto en los conectores J15 y J17 como en J16 y J18.

Desinstalar el jumper de fin de línea de la tarjeta de control y conectar la estación de recarga con la siguiente estación que conforme el anillo de comunicación (cable gris oscuro en la siguiente figura).

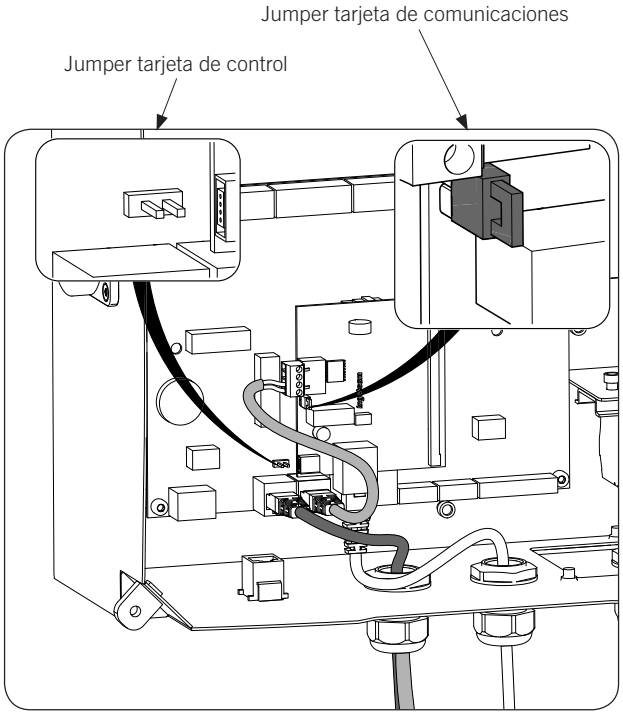


2. Conectar el cableado que une la tarjeta de control con la tarjeta de comunicaciones (ver el cable gris claro en la siguiente figura).

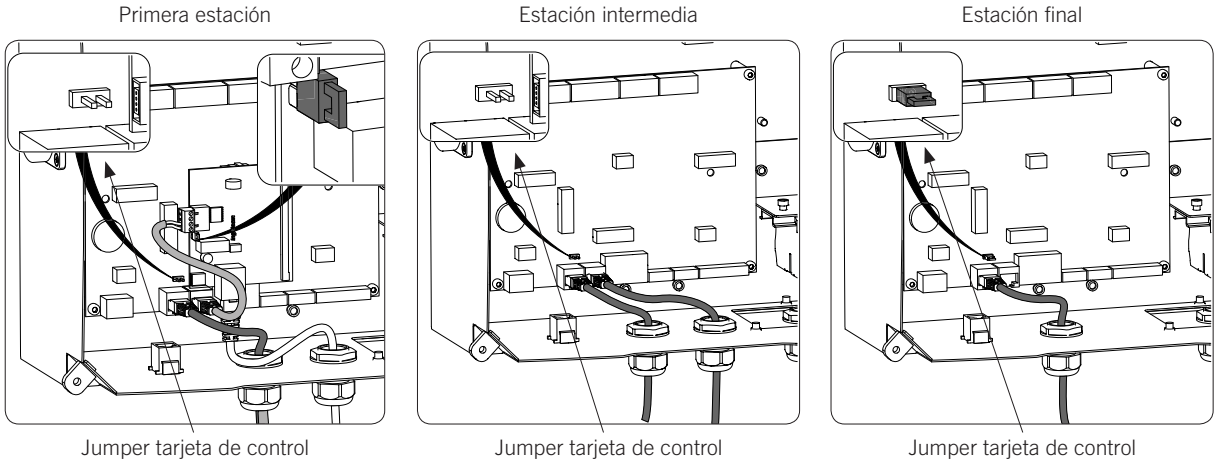
Pin	Color	Señal
1	Blanco/Naranja	RS-485 B (+)
2	Naranja	RS-485 A (–)

Conectar el módem a la tarjeta de comunicaciones (ver el cable blanco en la siguiente figura).

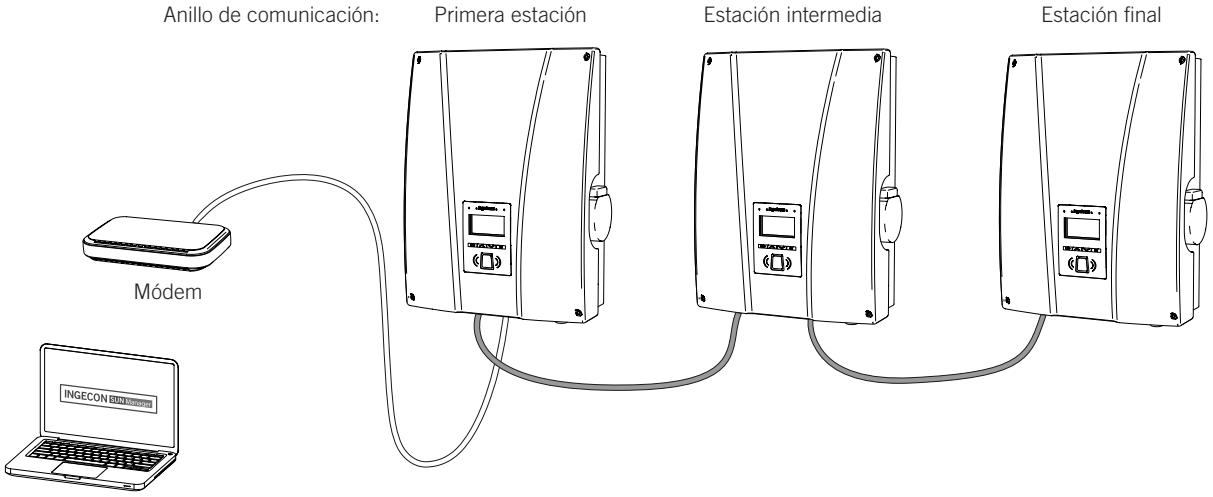
El jumper de la tarjeta de comunicaciones deberá permanecer instalado.



3. Conectar el resto de estaciones de recarga tal y como se indica en las siguientes figuras:



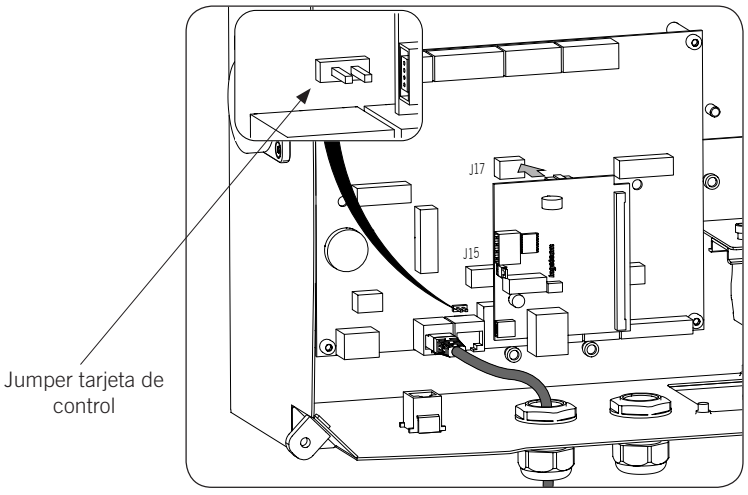
El jumper de la tarjeta de control deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.



Podrán conectarse un máximo de 10 equipos entre sí.

4.3.2. Comunicación remota GPRS/3G mediante módem USB

1. Conectar la tarjeta de comunicaciones en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se puede conectar tanto en los conectores J15 y J17 como en J16 y J18.



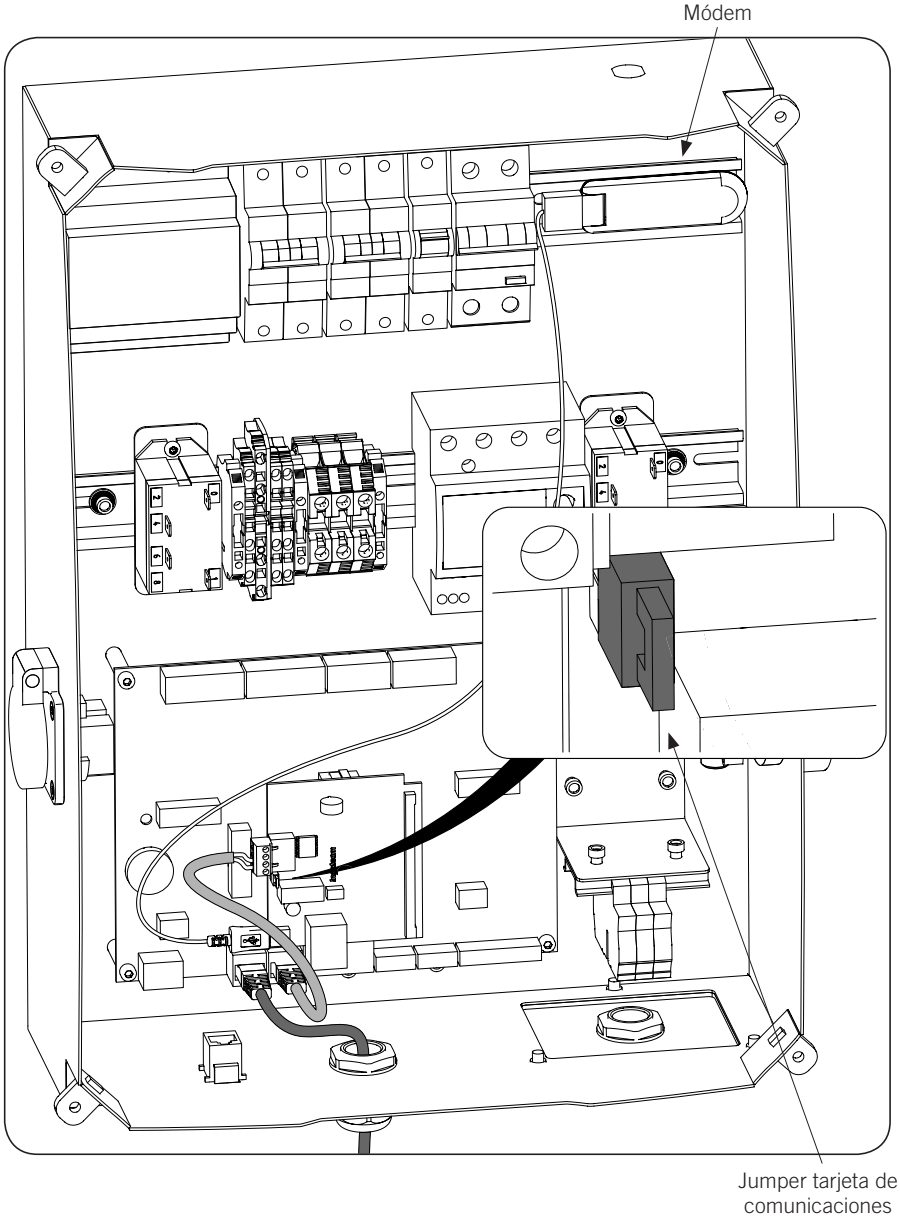
Desinstalar el jumper de fin de línea de la tarjeta de control y conectar la estación de recarga con la siguiente estación que conforme el anillo de comunicación (cable gris oscuro en la figura anterior).

2. Conectar el cableado que une la tarjeta de control con la tarjeta de comunicaciones (ver el cable gris claro en la siguiente figura).

Pin	Color	Señal
1	Blanco/Naranja	RS-485 B (+)
2	Naranja	RS-485 A (–)

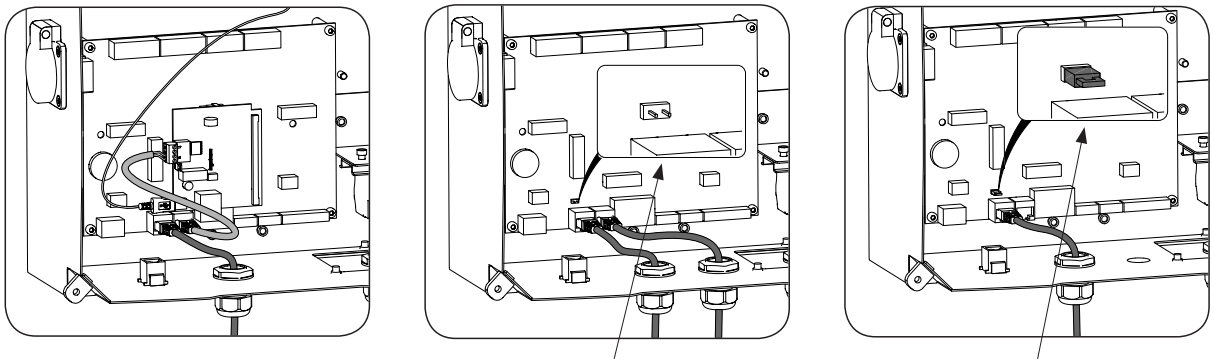
Conectar el módem USB a la tarjeta de comunicaciones para obtener conexión GPRS/3G (ver el cable blanco en la siguiente figura).

El jumper de la tarjeta de comunicaciones deberá permanecer instalado.



3. Conectar el resto de estaciones de recarga tal y como se indica en las siguientes figuras:

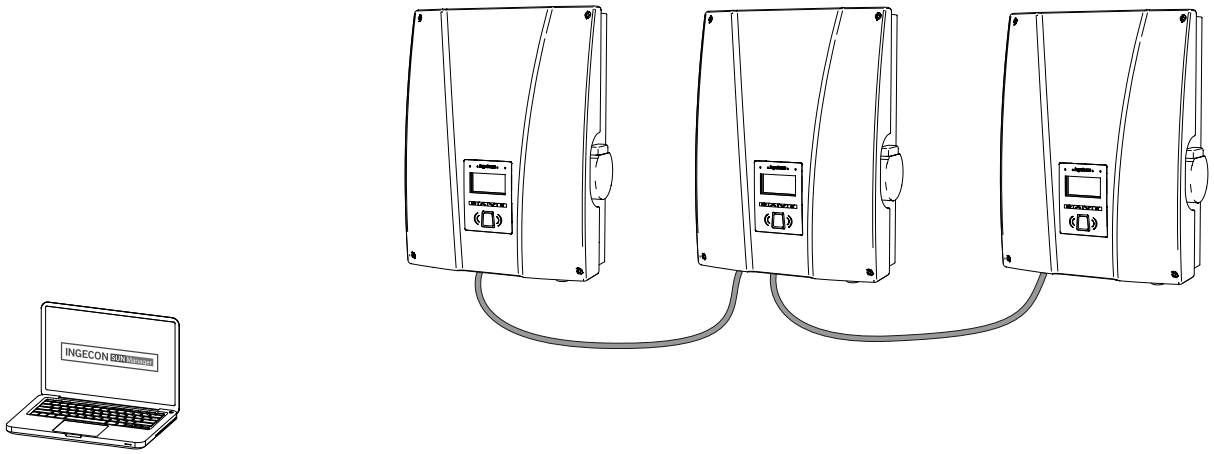
Primera estación Estación intermedia Estación final



Jumper tarjeta de control Jumper tarjeta de control

El jumper de la tarjeta de control deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.

Anillo de comunicación: Primera estación Estación intermedia Estación final

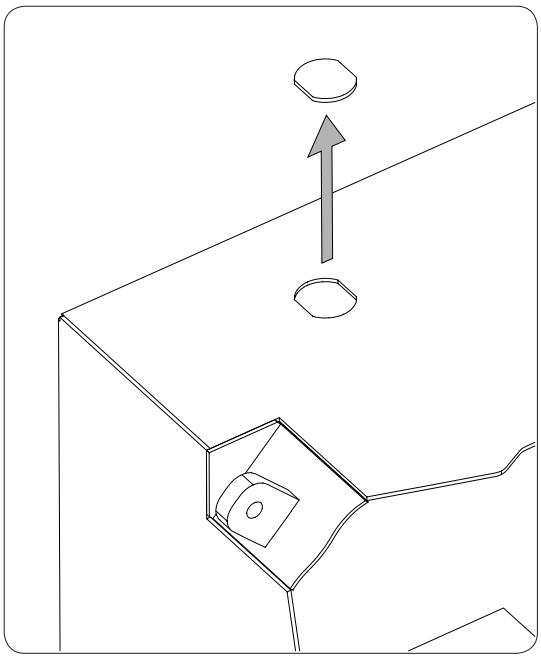


Podrán conectarse un máximo de 10 equipos entre sí.

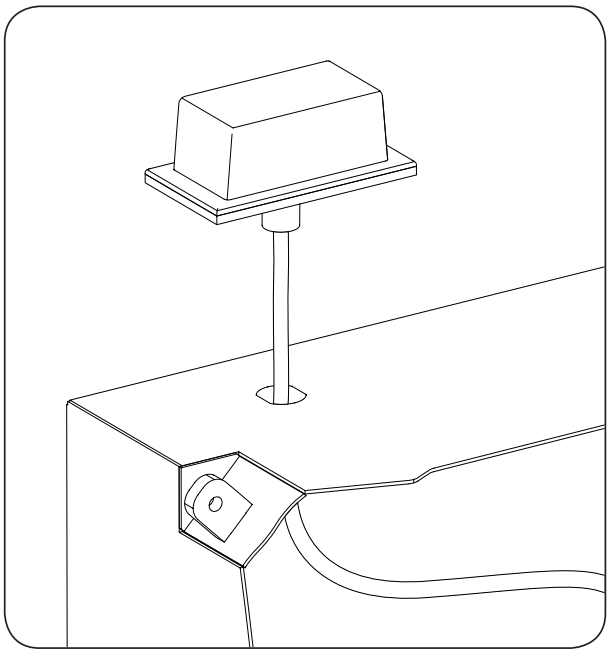
Antena para módem USB

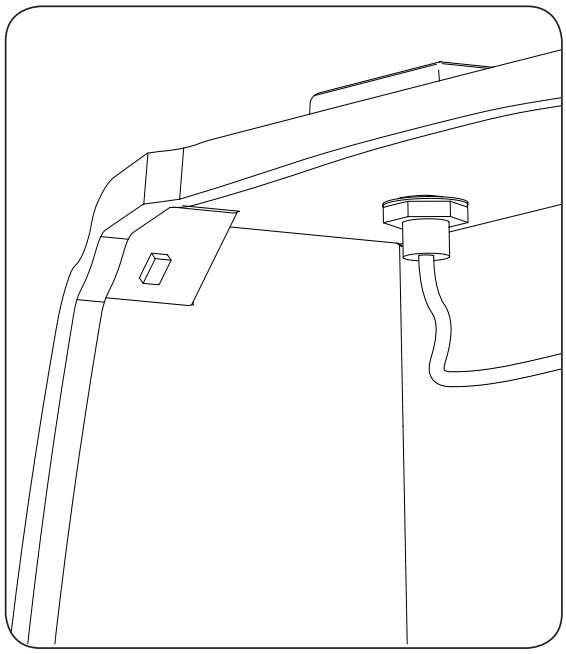
Opcionalmente se puede solicitar una antena exterior para ampliar la señal del módem. A continuación se muestra el proceso de conexión.

1. Eliminar el precortado de la parte superior de la estación.



2. Introducir el cableado de la antena a través del orificio y fijar la antena a la estación mediante la tuerca suministrada.





3. Conectar el cableado de la antena al módem.

5. INGEREV CITY

5.1. Comunicación local

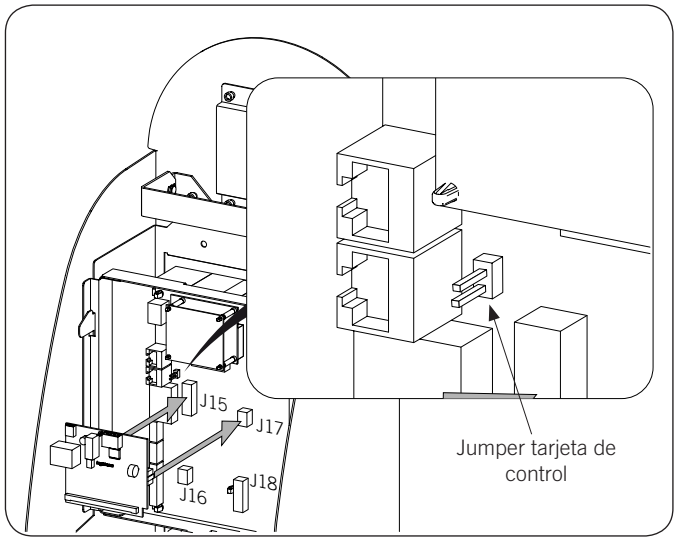
Las estaciones de recarga INGEREV CITY incorporan un bus de datos RS-485 local que permite la conexión entre diferentes estaciones. Consultar el manual de instalación correspondiente para ampliar esta información.

5.2. Comunicación remota

5.2.1. Comunicación remota mediante módem externo

1. Conectar la tarjeta de comunicaciones con conexión Ethernet en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se puede conectar tanto en los conectores J15 y J17 como en J16 y J18.

Desinstalar el jumper de fin de línea de la tarjeta de control:



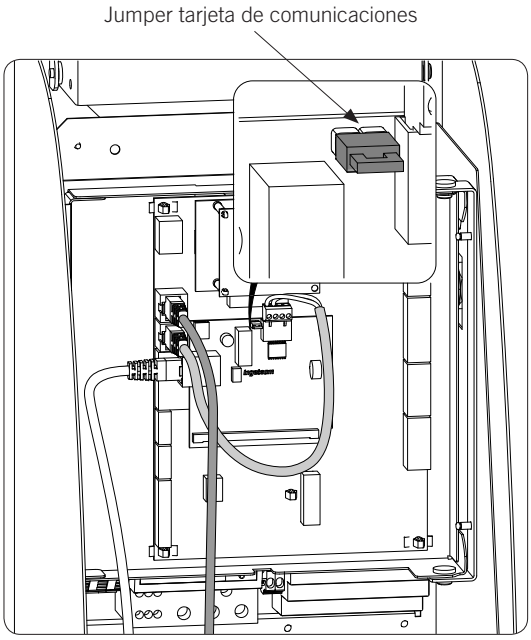
2. Realizar el cableado que une la tarjeta de control con la tarjeta de comunicaciones (ver el cable gris claro en la siguiente figura).

Pin	Color	Señal
1	Blanco/Naranja	RS-485 B (+)
2	Naranja	RS-485 A (–)

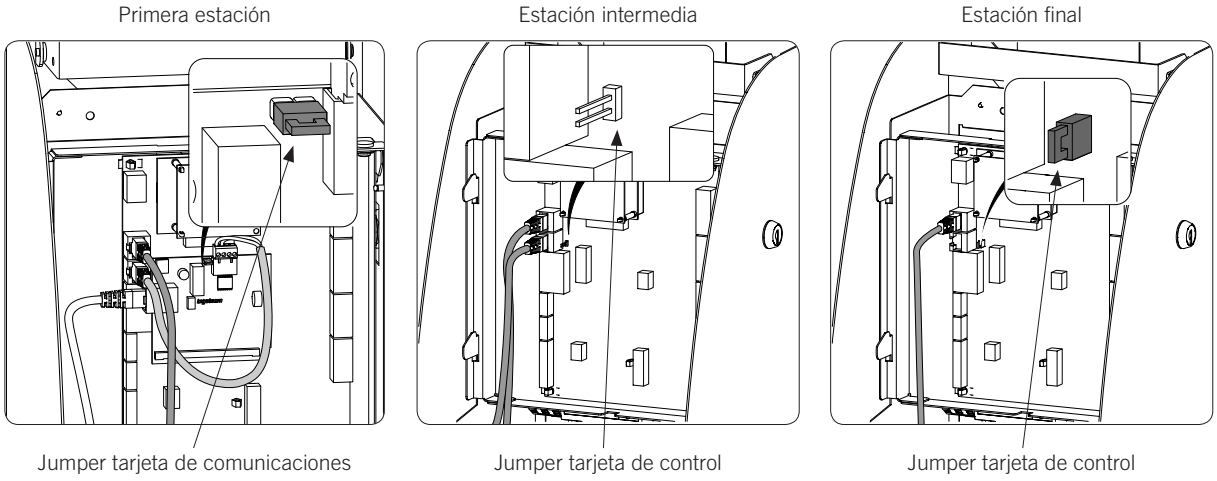
Conectar el módem a la tarjeta de comunicaciones (ver el cable blanco en la siguiente figura).

Desde el conector RJ45 libre se conectará la estación con la siguiente estación que conforme el anillo de comunicación (ver el cable gris oscuro en la siguiente figura).

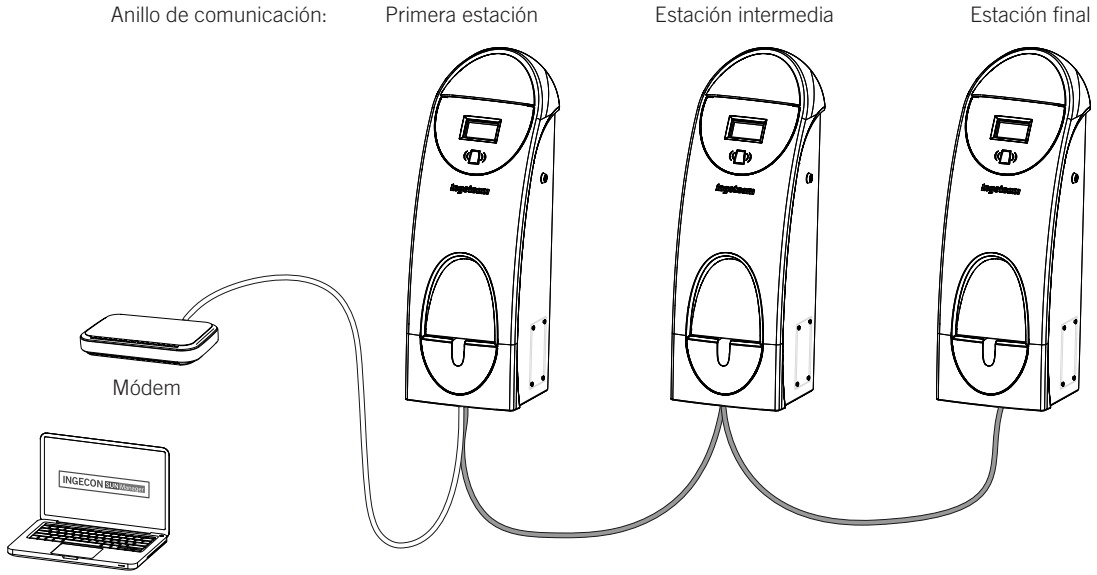
El jumper de la tarjeta de comunicaciones deberá permanecer instalado.



3. Conectar el resto de estaciones de recarga tal y como se indica en las siguientes figuras:



El jumper de la tarjeta de control deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.

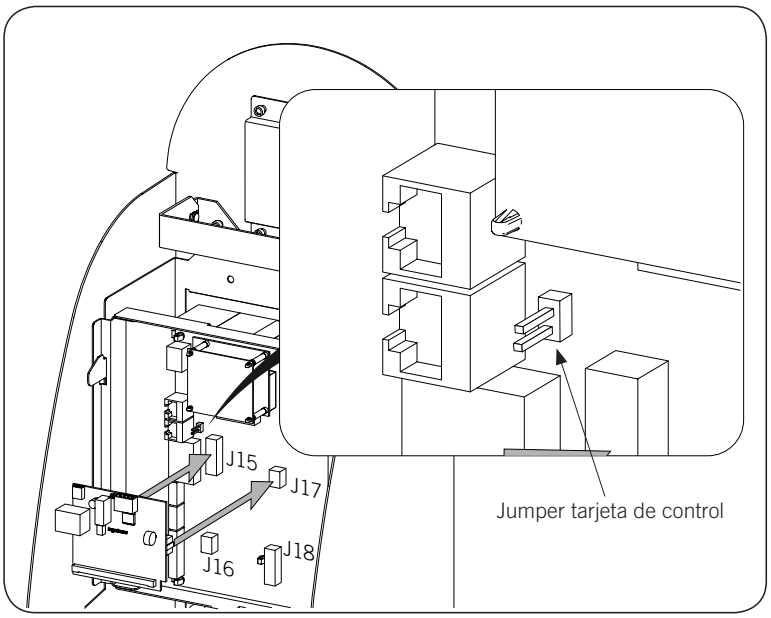


Podrán conectarse un máximo de 10 equipos entre sí.

5.2.2. Comunicación remota GPRS/3G mediante módem USB

1. Conectar la tarjeta de comunicaciones en una de las estaciones de recarga situadas en un extremo de la instalación para iniciar el anillo de comunicación. Se puede conectar tanto en los conectores J15 y J17 como en J16 y J18.

Desinstalar el jumper de fin de línea de la tarjeta de control:



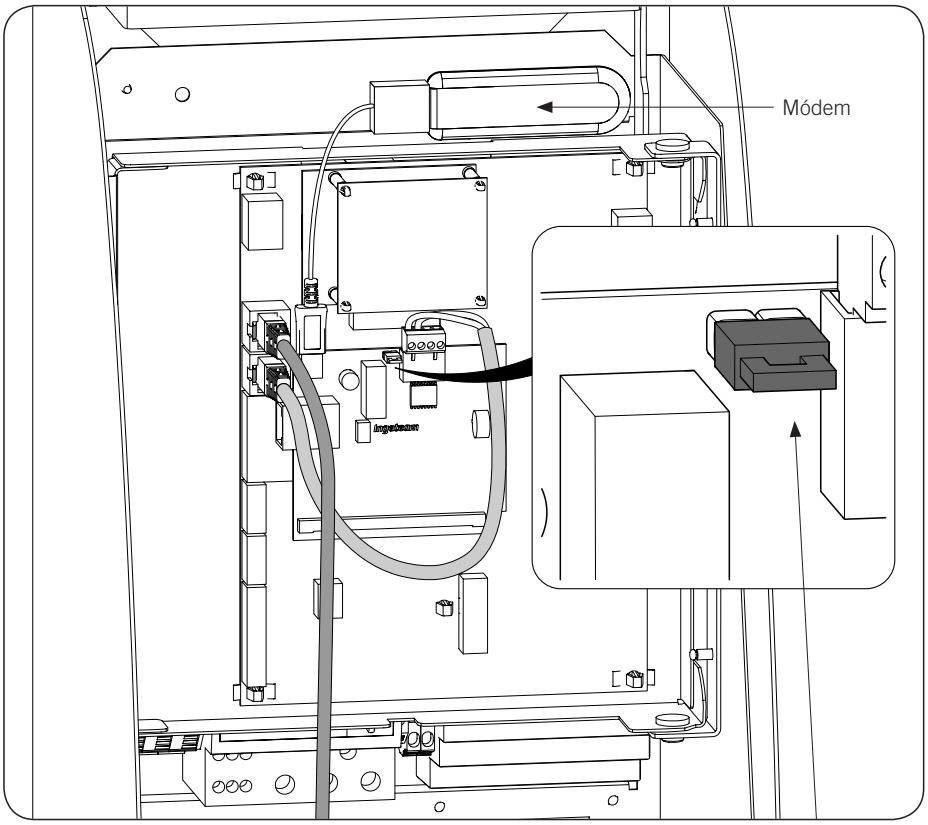
2. Realizar el cableado que une la tarjeta de control con la tarjeta de comunicaciones (ver el cable gris claro en la siguiente figura).

Pin	Color	Señal
1	Blanco/Naranja	RS-485 B (+)
2	Naranja	RS-485 A (–)

Conectar el módem USB a la tarjeta de comunicaciones para obtener conexión GPRS/3G (ver el cable blanco en la siguiente figura).

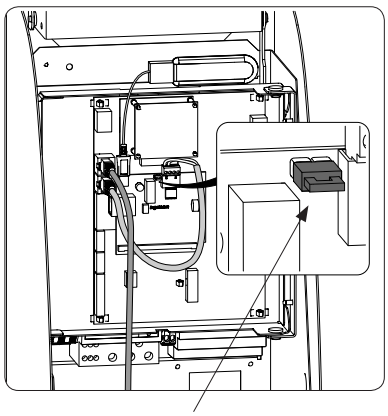
Desde el conector RJ45 libre se conectará la estación con la siguiente estación que conforme el anillo de comunicación (ver el cable gris oscuro en la siguiente figura).

El jumper de la tarjeta de comunicaciones deberá permanecer instalado.

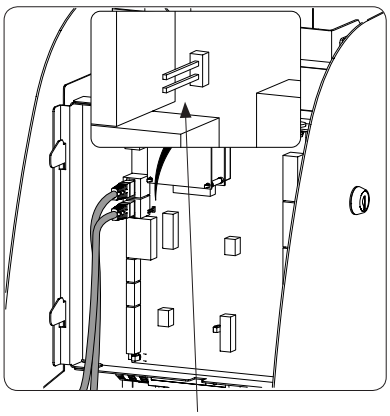


3. Conectar el resto de estaciones de recarga tal y como se indica en las siguientes figuras:

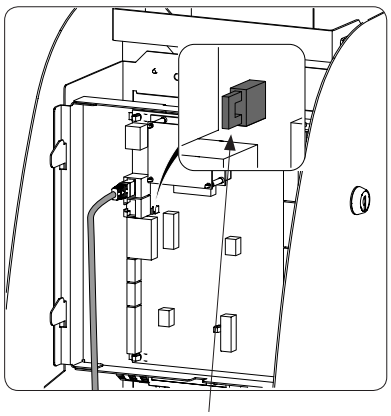
Primera estación



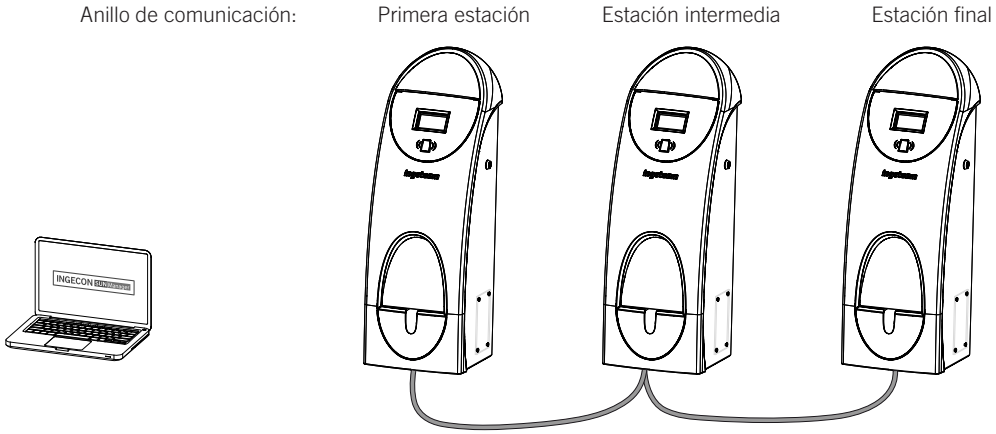
Estación intermedia



Estación final



El jumper de la tarjeta de control deberá estar desinstalado en todas las estaciones salvo en la última del anillo de comunicación, en la que sí deberá estar instalado.



Podrán conectarse un máximo de 10 equipos entre sí.

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1. Information concernant ce manuel

L'objectif de ce guide est de décrire la communication des bornes de recharge INGEREV. L'accès à toutes les bornes de recharge peut être local ou à distance. Dans le second cas, il est réalisé à l'aide d'un modem externe propre à l'installation ou d'un modem USB, en fonction de ce qui a été demandé au moment de la commande.

La configuration et le monitorage de toutes les bornes sont effectués par le logiciel INGECON SUN Manager, fourni par Ingeteam.

1.1. Champ d'application

Ce guide est valable pour tous les modèles des familles INGEREV suivantes :

INGEREV GARAGE Basic

INGEREV GARAGE

INGEREV CITY

1.2. Destinataires

Le présent document est dirigé au personnel qualifié.

Les aptitudes du personnel qualifié auxquelles se réfère ce manuel doivent être, au minimum, celles qui satisfont à toutes les normes, règlements et lois en matière de sécurité applicables aux travaux d'installation et au fonctionnement de tous les éléments de l'installation.

La réalisation de toute opération par du personnel non autorisé par Ingeteam peut entraîner l'annulation de la garantie originale de l'équipement.

La responsabilité de désigner le personnel qualifié est toujours à la charge de l'entreprise à laquelle appartient ce personnel. Pour préserver la sécurité de l'employé tout en respectant la loi sur la sécurité au travail, c'est à l'entreprise de déterminer qui est apte ou non à réaliser un travail.

Ces entreprises sont responsables de former leur personnel sur les appareils électroniques ainsi que de le familiariser avec le contenu de ce manuel.

1.3. Symbolique

Tout au long de ce manuel, divers symboles sont utilisés afin de souligner et de mettre en valeur certaines parties du texte. La signification générale de ces symboles est la suivante :

Avertissement général.

Lire la section indiquée

Risque électrique.

Interdiction.

2. Sécurité

Cette section décrit les avertissements de sécurité et les équipements de protection individuelle.

2.1. Conditions de sécurité

Avertissements généraux

Les opérations décrites dans ce manuel ne doivent être réalisées que par du personnel qualifié.

Les aptitudes du personnel qualifié auxquelles se réfère ce manuel doivent être, au minimum, celles qui satisfont à toutes les normes, règlements et lois en matière de sécurité applicables aux travaux d'installation et à l'utilisation de cet appareil.

Tenir compte qu'il est obligatoire de respecter la législation en vigueur en matière de sécurité pour les travaux d'électricité. Il existe un danger de décharge électrique.

Le respect des instructions de sécurité exposées dans ce manuel ou de la loi n'exclut pas de se conformer aux autres normes spécifiées de l'installation, du lieu, du pays ou de toute autre circonstance qui affecte l'appareil.

L'ouverture de l'enveloppe n'implique pas qu'il n'y ait pas de tension à l'intérieur.

Il existe un risque de décharge électrique, y compris après la déconnexion de toutes les sources d'énergie du système.

Seul le personnel qualifié est autorisé à l'ouvrir en respectant les instructions de ce manuel.

Il est obligatoire de lire et de comprendre le manuel dans son intégralité avant de commencer à manipuler, installer ou mettre en marche l'appareil.

Les normes de sécurité de base à respecter obligatoirement pour chaque pays sont les suivantes :

- *RD 614/2001* en Espagne.
- *CEI 11-27* en Italie.
- *DIN VDE 0105-100* et *DIN VDE 1000-10* en Allemagne.
- *UTE C18-510* en France.

Pour contrôler l'absence de tension, il faut impérativement utiliser des éléments de mesure de catégorie III-1 000 volts.

Ingeteam n'assume pas la responsabilité des dommages dérivant d'une mauvaise utilisation des appareils. Toute intervention réalisée sur l'un de ces appareils et supposant une modification du câblage électrique par rapport au câblage initial doit être préalablement présentée à Ingeteam. Ces modifications devront être étudiées et approuvées par Ingeteam.

Effectuer toutes les manœuvres et manipulations hors tension.

En tant que mesure minimale de sécurité pour cette opération, **5 règles d'or** doivent être observées :

1. Déconnecter.
2. Éliminer toute possibilité de rétroaction.
3. Vérifier l'absence de tension.
4. Mettre à la terre et court-circuiter.
5. Le cas échéant, protéger des éléments sous tension à proximité et mettre en place une signalisation de sécurité pour délimiter la zone de travail.

Tant que ces cinq étapes n'auront pas été réalisées, le travail ne sera pas autorisé en tant que travail hors tension mais sera considéré comme travail sous tension dans la partie concernée.

Dangers potentiels pour l'appareil

Tenir compte des avertissements suivants afin de protéger l'appareil.

Après toutes les manipulations dûment autorisées, vérifier que l'appareil est prêt à fonctionner. Seulement après, connecter l'appareil en suivant les instructions du manuel.

Ne pas toucher les cartes ni les composants électroniques. Les composants les plus sensibles peuvent être endommagés ou détruits par l'électricité statique.

Ne pas procéder à la déconnexion ou à la connexion d'une cosse lorsque l'appareil est en marche. Déconnectez-le et vérifiez l'absence de tension avant de procéder.

2.2. Équipements de protection individuelle (EPI)

Lors de la réalisation de travaux sur l'appareil, utiliser toujours, au minimum, les équipements de sécurité suivants recommandés par Ingeteam.

Dénomination	Explication
Chaussures de sécurité	Conformes à la norme *UNE-EN-ISO 20345:2012*
Casque	Conformes à la norme *EN 397 :1995*
Casque avec visière de protection	Conforme à la norme *UNE-EN 166:2002*, à condition qu'il existe des éléments en tension directement accessibles
Vêtements de travail	Ajustés, ignifugés, 100% coton
Gants diélectriques	Conformes à la norme *EN 60903 :2005*

Les outils et/ou appareils utilisés pour les travaux sous tension doivent posséder, au moins, une isolation de classe III-1 000 volts.

Dans le cas où la réglementation locale exige d'autres types d'équipements de protection individuelle, les équipements recommandés par Ingeteam doivent être dûment complétés.

2.3. Traitement des déchets

Une fois arrivées en fin de vie, les cartes à circuits imprimés doivent être remises à un centre de récupération agréé pour leur recyclage correct.

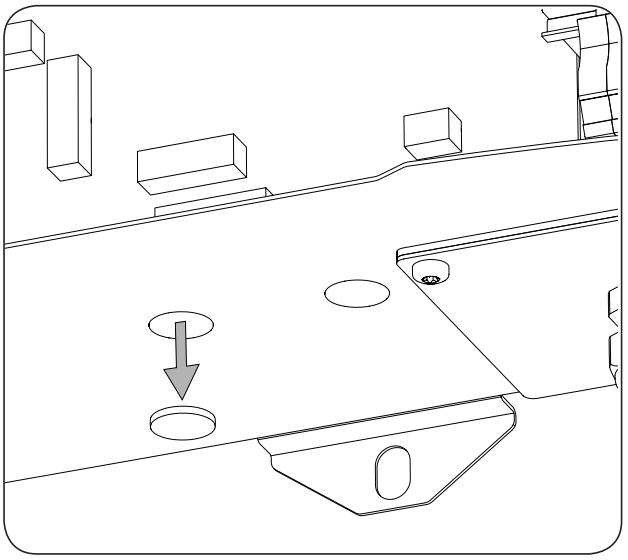
3. INGEREV GARAGE Basic

3.1. Installation de presse-étoupes PG

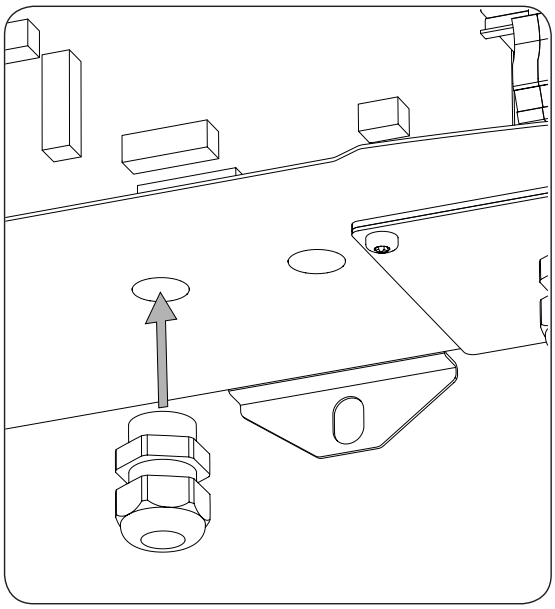
Pour l'installation des accessoires de communication sur les bornes de recharge INGEREV GARAGE Basic, il est nécessaire d'installer des presse-étoupes PG pour faire passer les câbles entre les bornes.

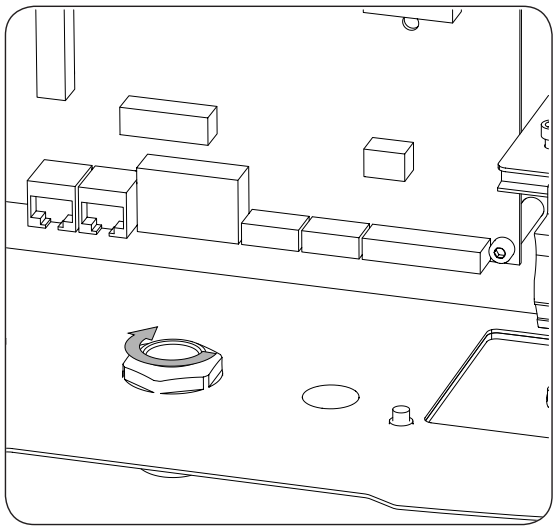
Pour l'installation des presse-étoupes PG, suivre les instructions suivantes :

1. Éliminer l'un des prédécoupés de la plaque de connexion inférieure.

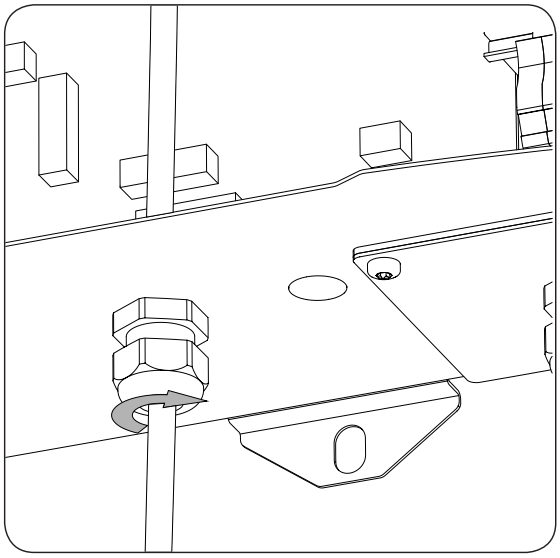


2. Introduire le presse-étoupe PG dans l'orifice et visser l'écrou.





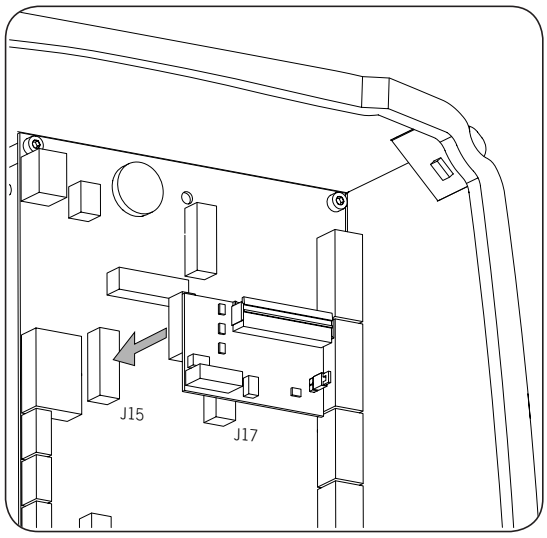
3. Introduire le câblage et serrer le presse-étoupe PG. Laisser du mou pour que le câble ne soit pas tendu.



3.2. Communication locale

Pour réaliser la connexion locale, suivez les étapes suivantes :

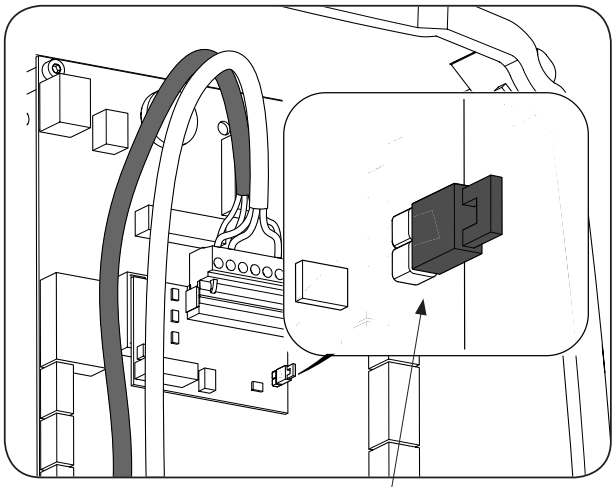
1. Raccorder la carte de communication RS-485 à toutes les bornes de recharge qui constituent l'anneau de communication. La raccorder dans les connecteurs J15 et J17.

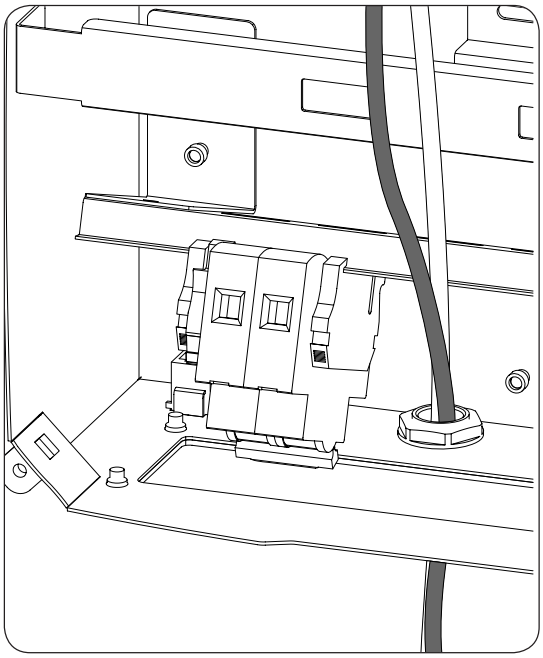


2. Procéder au accordement de la carte de communication avec celle de la borne de recharge suivante (voir le câble gris foncé sur l'illustration suivante).

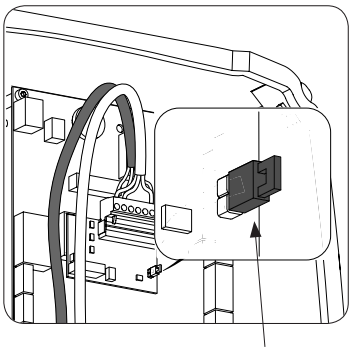
Broche	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

Utiliser un convertisseur USB RS-485 (non fourni par Ingeteam) pour raccorder l'ordinateur à la première borne de l'anneau de communication (câble blanc sur l'illustration suivante).

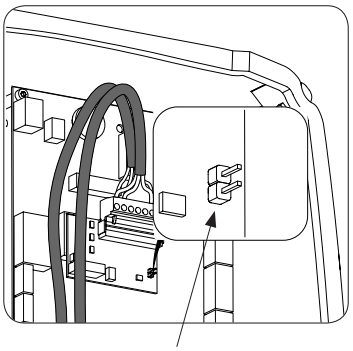




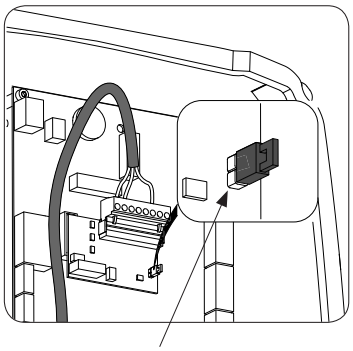
Première borne de recharge

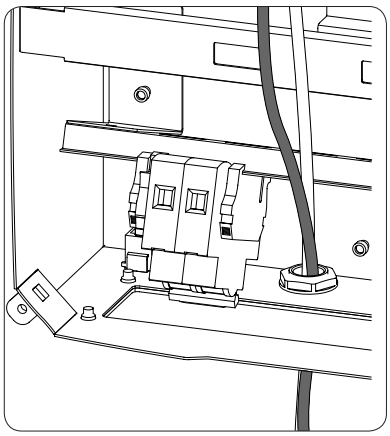


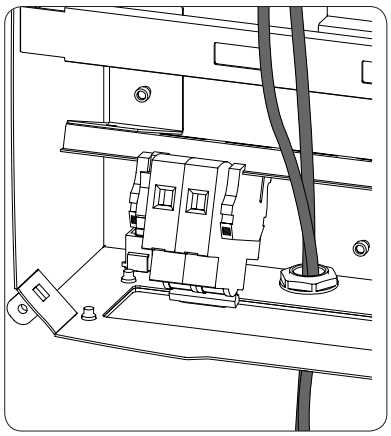
Borne de recharge intermédiaire

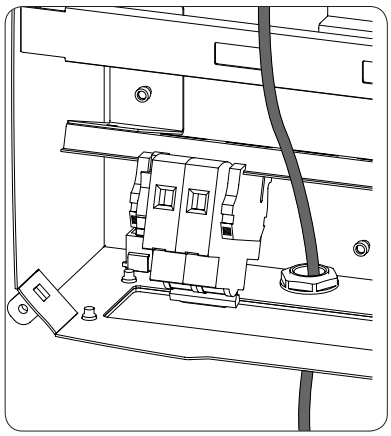


Borne de recharge finale

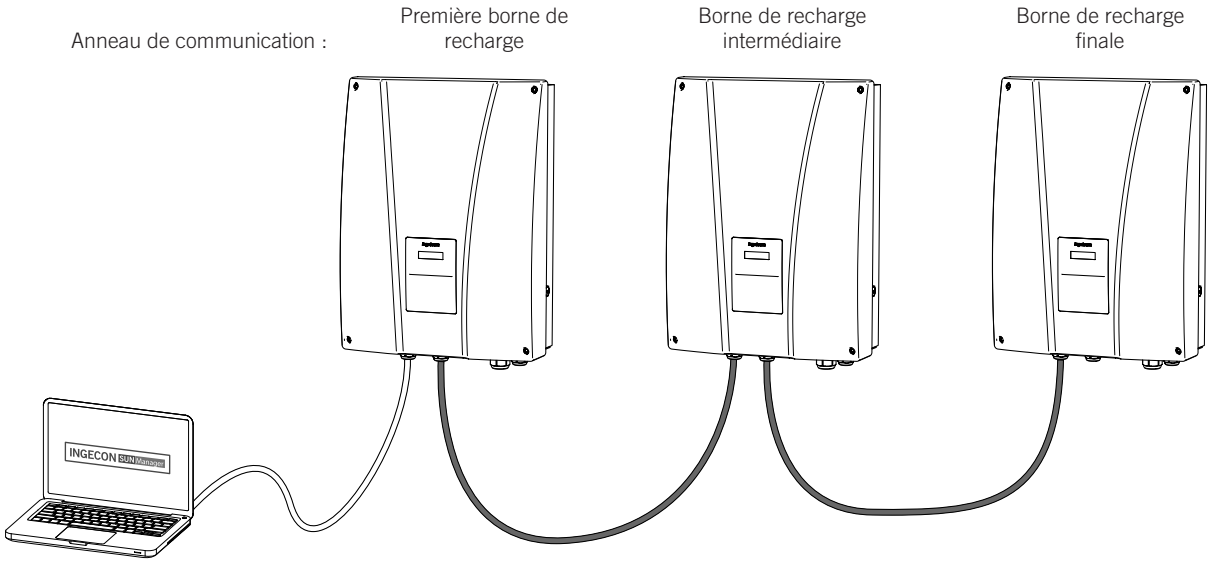








Le jumper des cartes RS-485 doit être désinstallé sur toutes les bornes de recharge intermédiaire de l'anneau de communication.

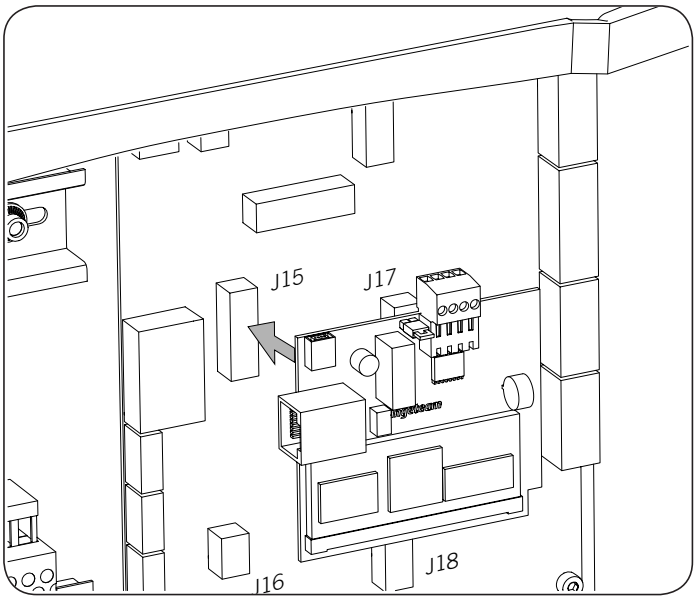


Un maximum de 10 équipements pourra être raccordé.

3.3. Communication à distance

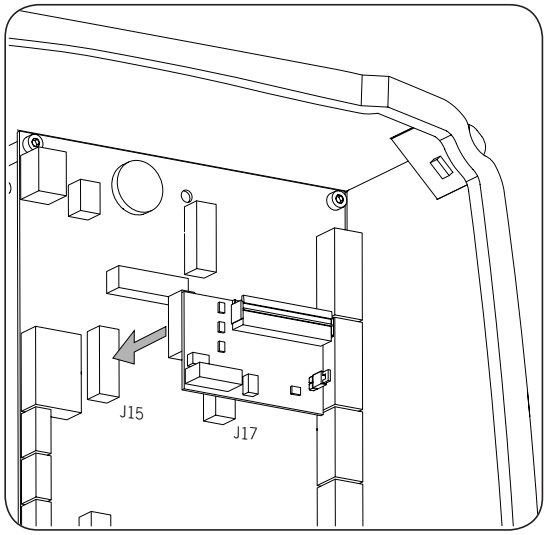
3.3.1. Communication à distance par modem externe

1. Raccorder la carte de communication avec connexion Ethernet à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. La raccorder dans les connecteurs J15 et J17.



Broche	Signal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Installer les cartes de communication RS-485 aux autres bornes de recharge qui constituent l'anneau de communication. Les raccorder aux connecteurs J15 et J17.

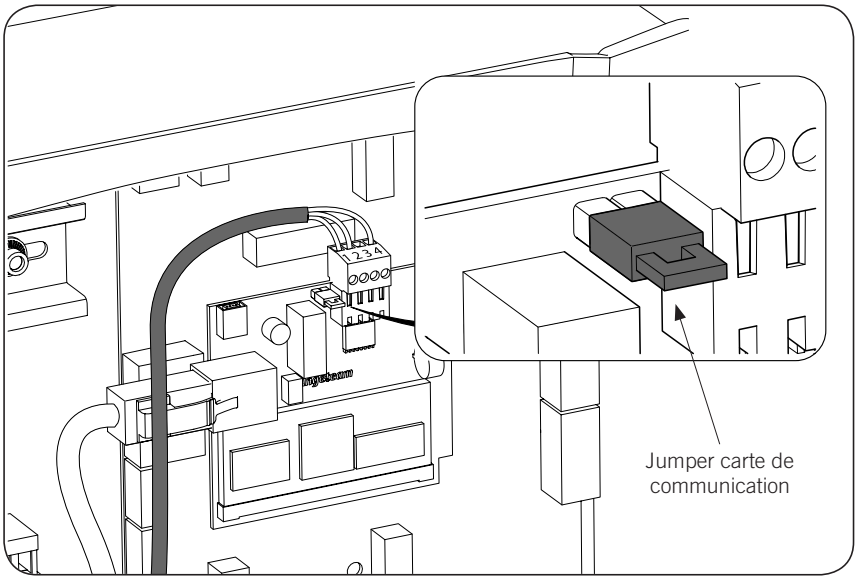


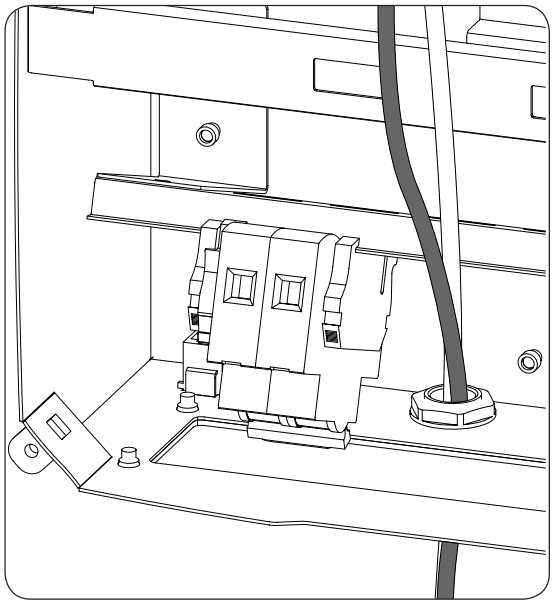
Broche	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

3. Procéder au accordement de la carte de communication avec celle de la borne de recharge suivante (voir le câble gris foncé sur l'illustration suivante).

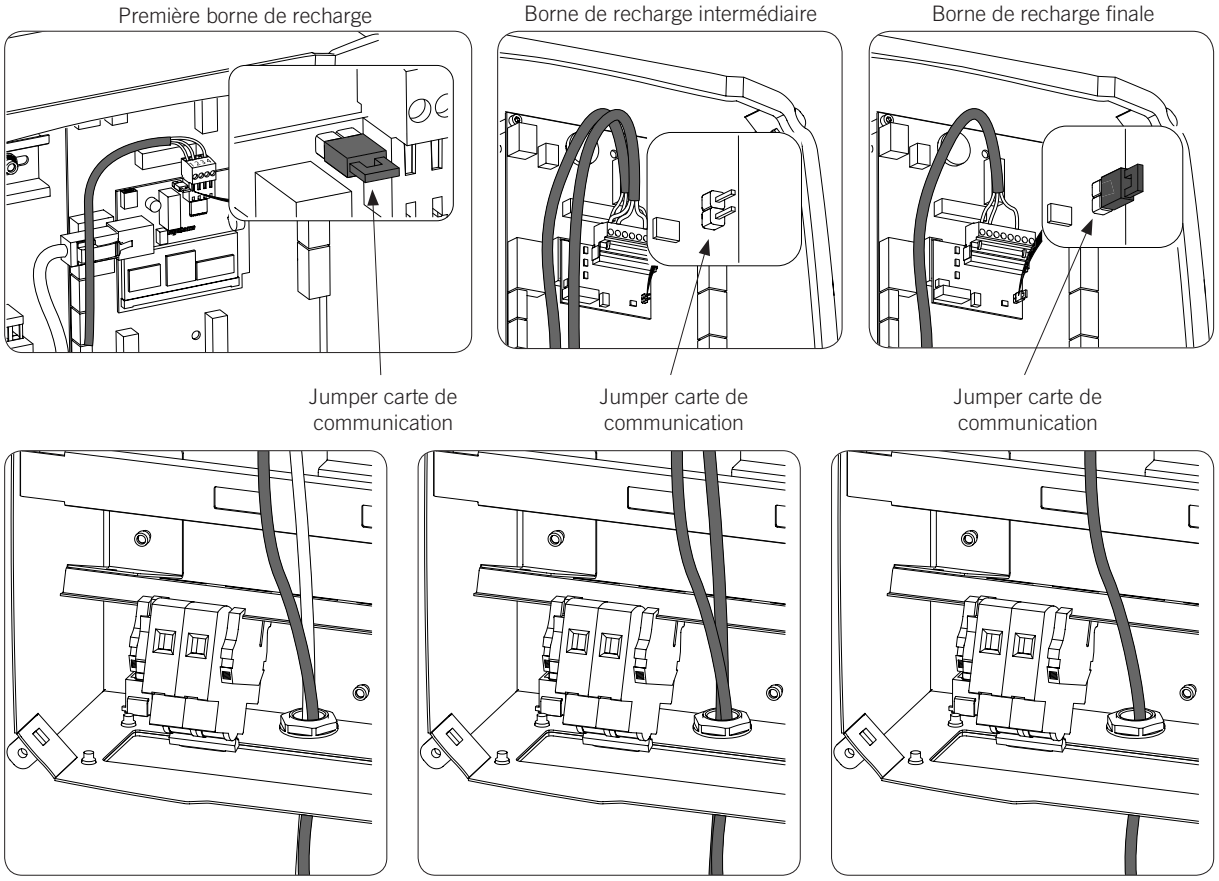
Raccorder le modem à la carte de communication de la première borne de recharge (voir le câble blanc sur l'illustration suivante).

Le jumper de la carte de communication de la première borne de recharge doit rester installé.

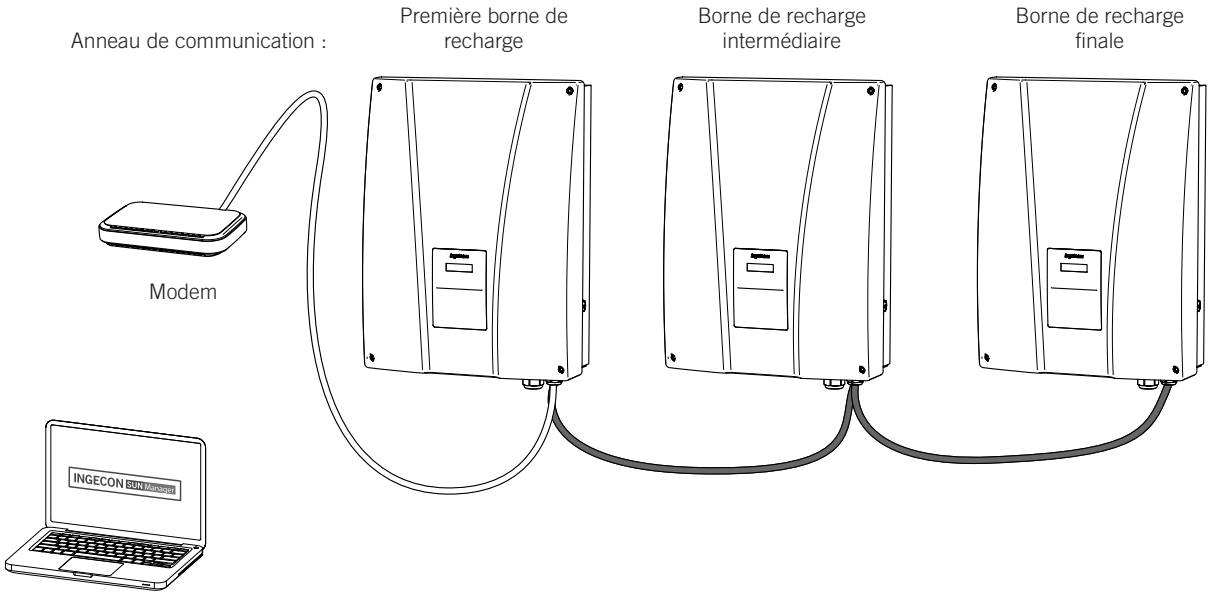




4. Connecter les autres bornes de recharge de l'anneau de communication comme indiqué sur les illustrations suivantes.


Première borne de recharge
Borne de recharge intermédiaire
Borne de recharge finale
Jumper carte de communication
Jumper carte de communication
Jumper carte de communication

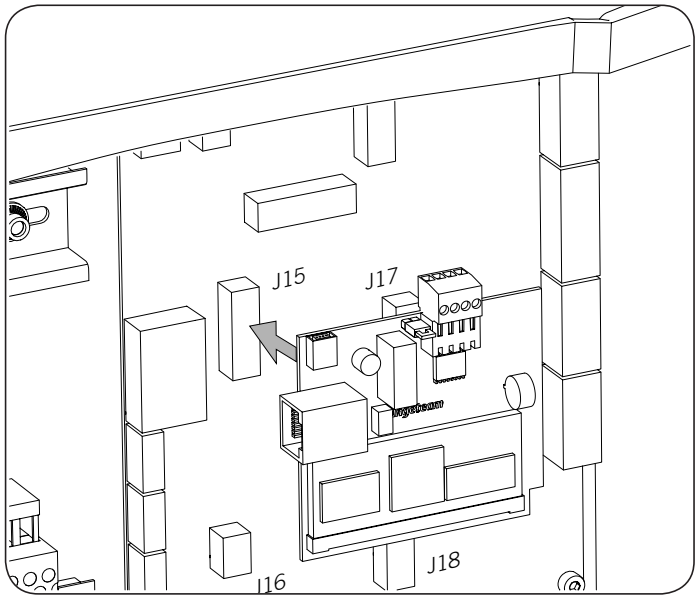
Le jumper des cartes RS-485 devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.



Un maximum de 10 équipements pourra être raccordé.

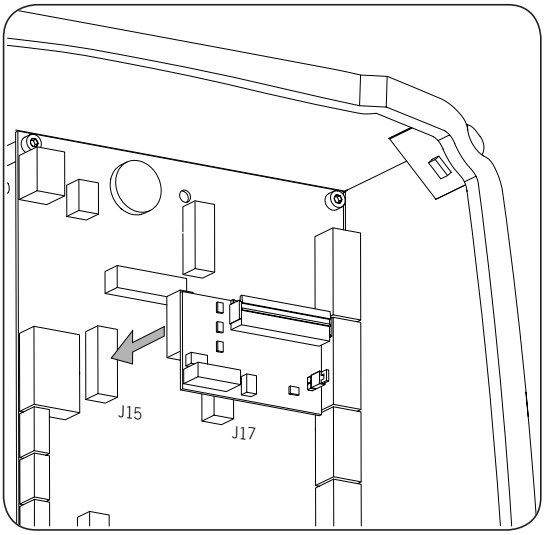
3.3.2. Communication à distance GPRS/3G par modem USB

1. Raccorder la carte de communication qui sera connectée au modem USB à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. La raccorder dans les connecteurs J15 et J17.



Broche	Signal
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Installer les cartes de communication RS-485 aux autres bornes de recharge qui constituent l'anneau de communication. Les raccorder aux connecteurs J15 et J17.

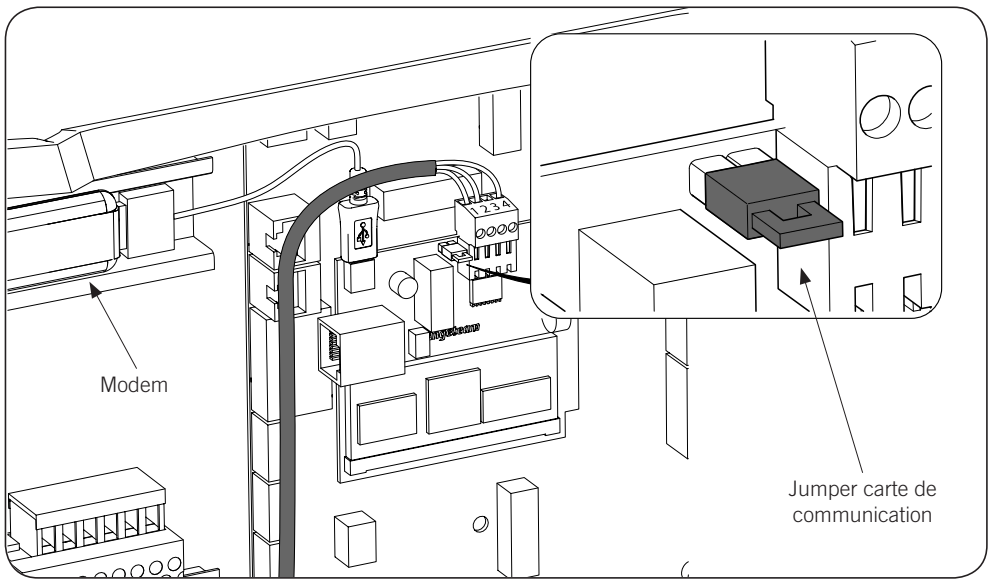


Broche	Signal
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

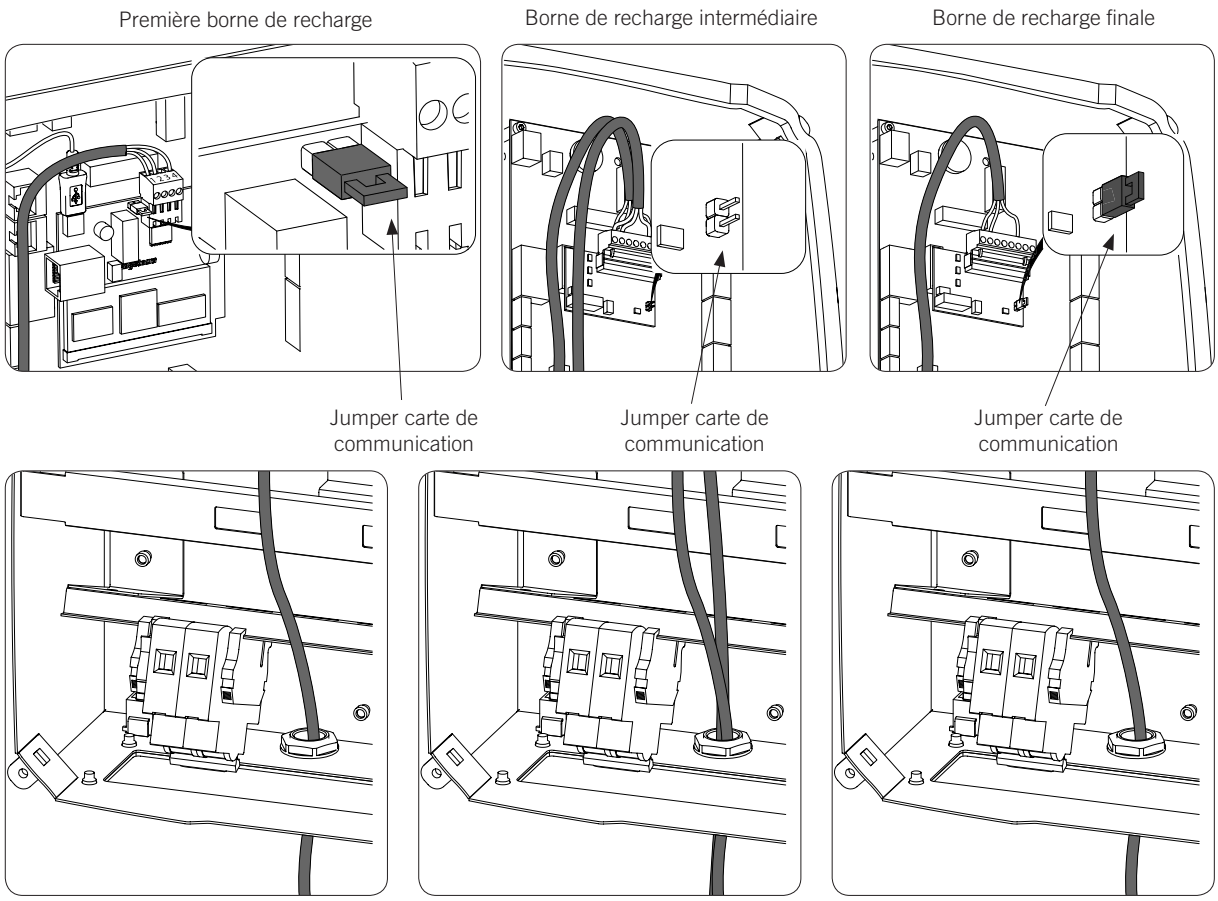
3. Procéder au accordement de la carte de communication avec celle de la borne de recharge suivante (voir le câble gris foncé sur l'illustration suivante).

Connecter le modem USB de la carte de communication de la première borne de recharge afin d'obtenir une connexion GPRS/3G.

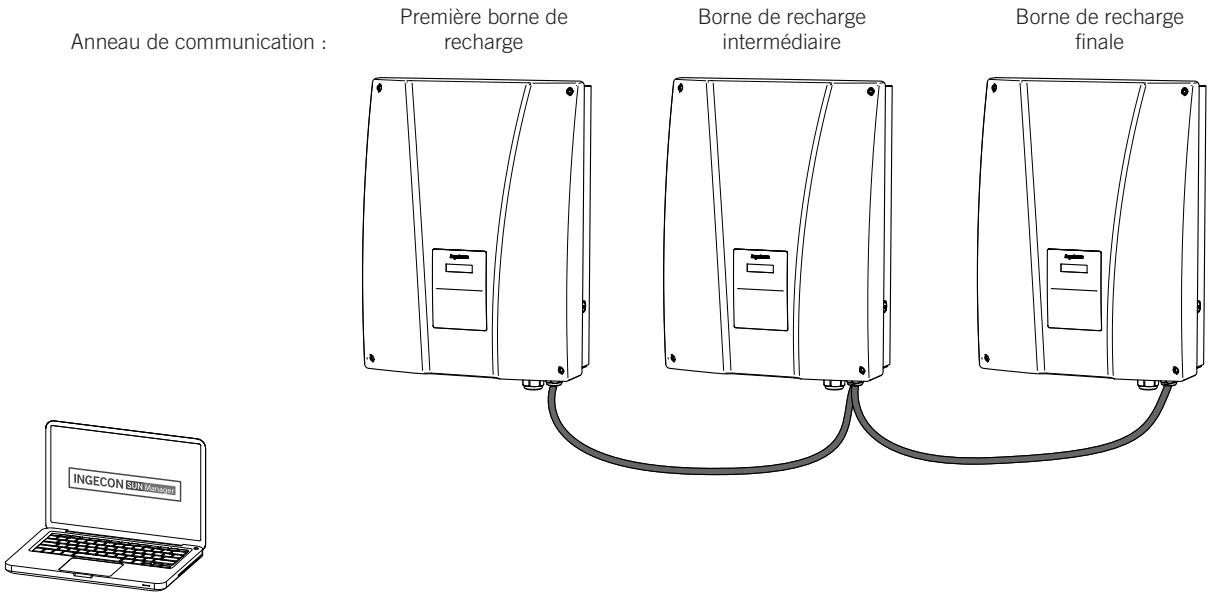
Le jumper de la carte de communication de la première borne de recharge doit rester installé.



4. Connecter les autres bornes de recharge comme indiqué sur les illustrations suivantes :


Première borne de recharge
Borne de recharge intermédiaire
Borne de recharge finale
Jumper carte de communication
Jumper carte de communication
Jumper carte de communication

Le jumper des cartes RS-485 devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.

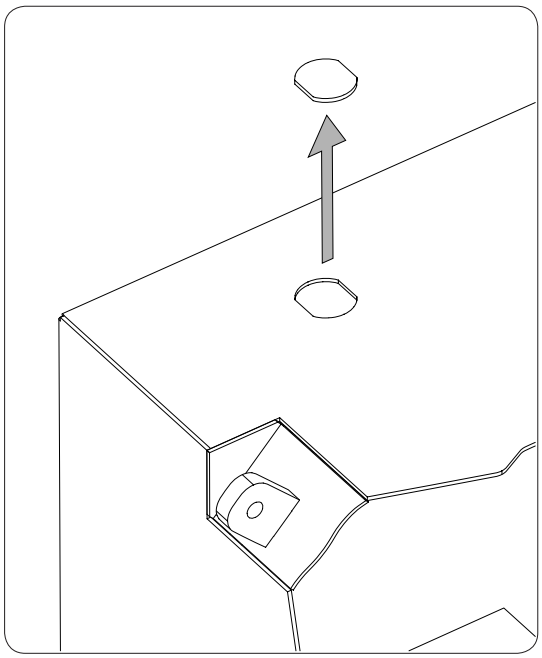


Un maximum de 10 équipements pourra être raccordé.

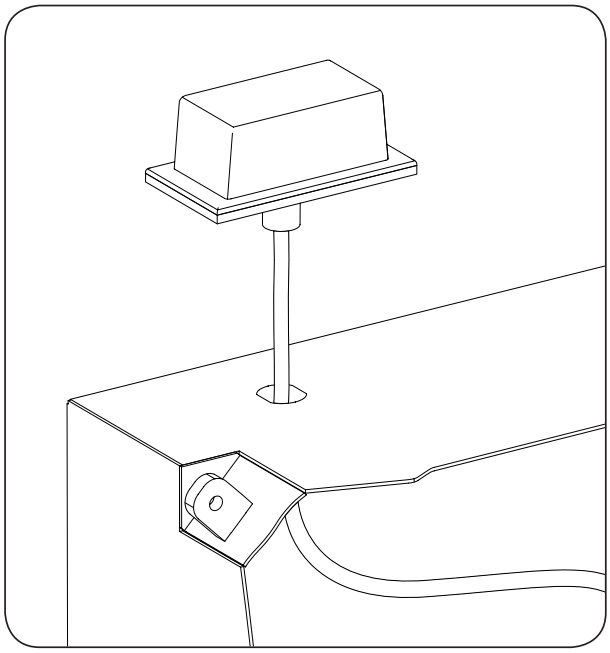
Antenne pour modem USB

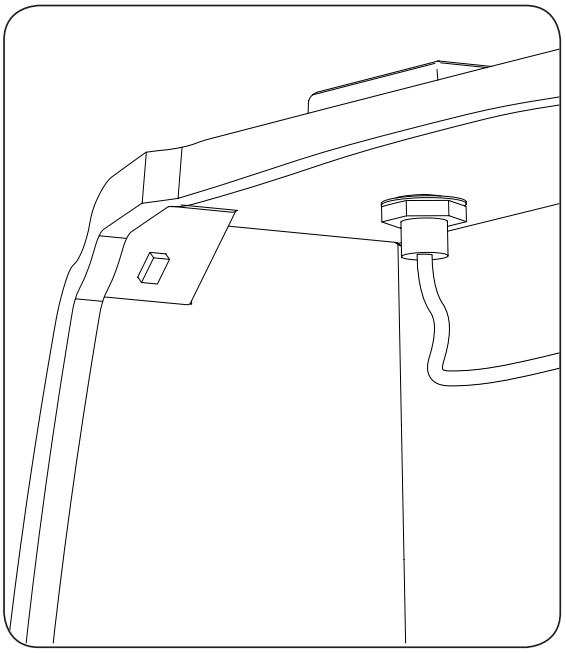
En option, une antenne extérieure pour renforcer le signal du modem peut être demandée. Le processus de connexion est indiqué ci-après.

1. Retirer le prédécoupé du haut de la borne de recharge.



2. Introduire le câblage de l'antenne par l'orifice et fixer l'antenne à la borne de recharge avec l'écrou fourni.





3. Raccorder le câblage de l'antenne au modem.

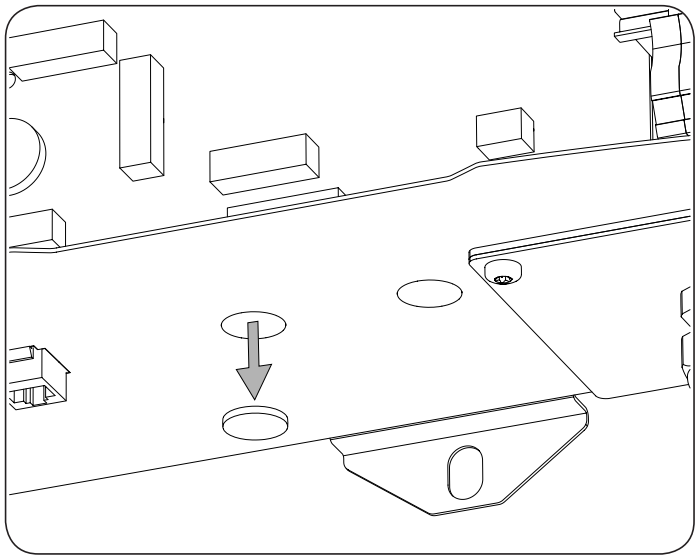
4. INGEREV GARAGE

4.1. Installation de presse-étoupes PG

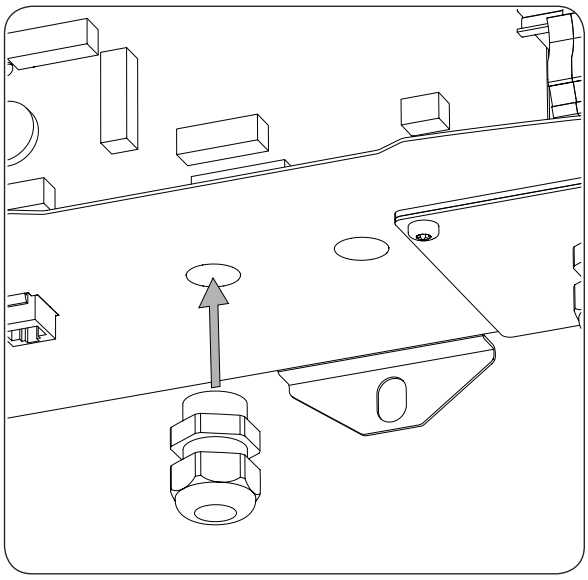
Pour l'installation des accessoires de communication sur les bornes de recharge INGEREV GARAGE, il est nécessaire d'installer des presse-étoupes PG pour faire passer les câbles entre les bornes.

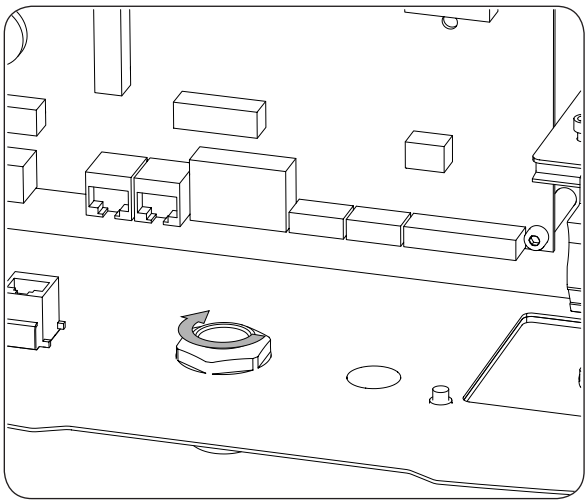
Pour l'installation des presse-étoupes PG, suivre les instructions suivantes :

1. Éliminer l'un des prédécoupés de la plaque de connexion inférieure.

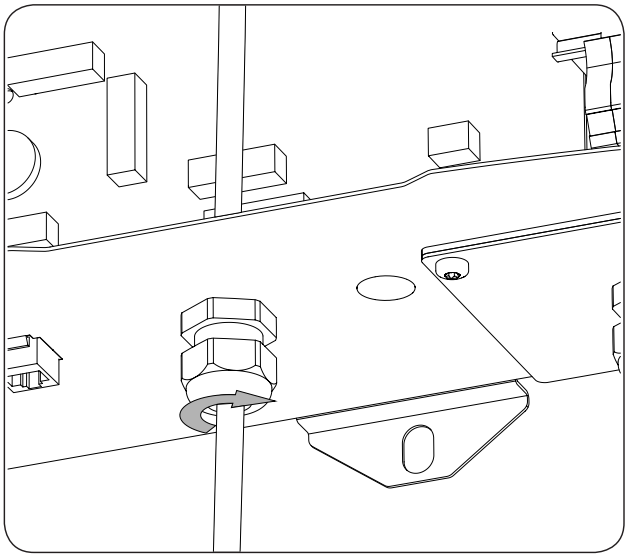


2. Introduire le presse-étoupe PG dans l'orifice et visser l'écrou.





3. Introduire le câblage et serrer le presse-étoupe PG. Laisser du mou pour que le câble ne soit pas tendu.

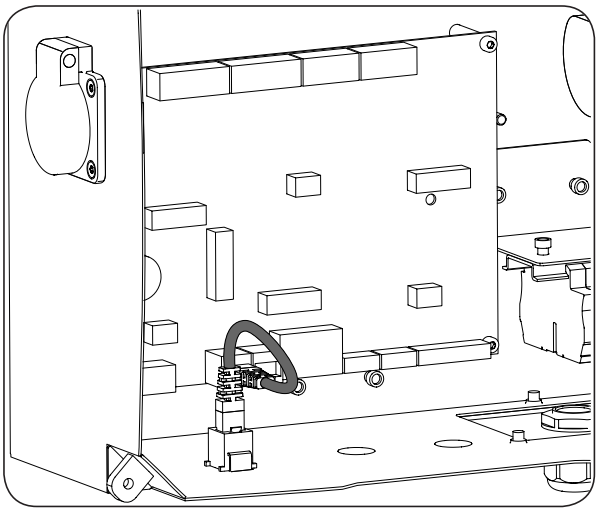


4.2. Communication locale

Les bornes de recharge INGEREV GARAGE sont équipées d'un bus de données RS-485 local et d'un connecteur RJ45 permettant la connexion entre différentes bornes de recharge. Pour de plus amples informations, consulter le guide d'installation correspondant.

4.3. Communication à distance

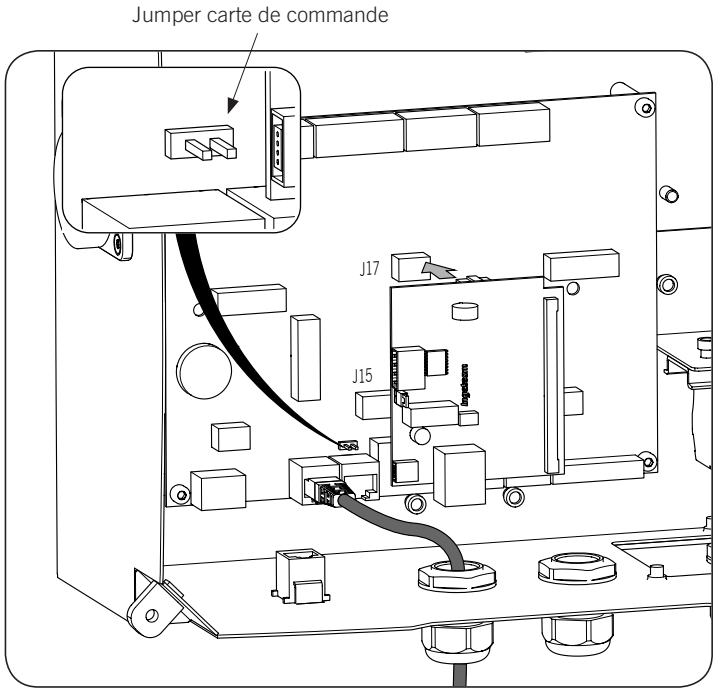
Pour réaliser la communication à distance par Ethernet ou modem USB sur les bornes de recharge INGEREV GARAGE, il est nécessaire de retirer le câble indiqué sur l'illustration suivante. Il est fourni pour la communication locale.



4.3.1. Communication à distance par modem externe

1. Raccorder la carte de communication avec connexion Ethernet à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. Elle peut être raccordée, aussi bien aux connecteurs J15 et J17 que J16 et J18.

Désinstaller le jumper de fin de ligne de la carte de commande et raccorder la borne de recharge à la suivante constituant l'anneau de communication (câble gris foncé sur l'illustration suivante).

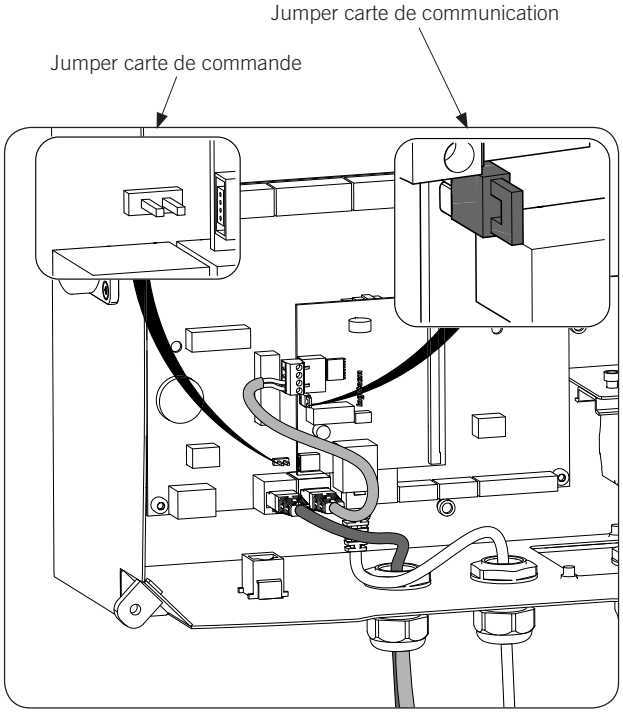


2. Raccorder la carte de commande à celle de communication (voir le câble gris clair sur l'illustration suivante).

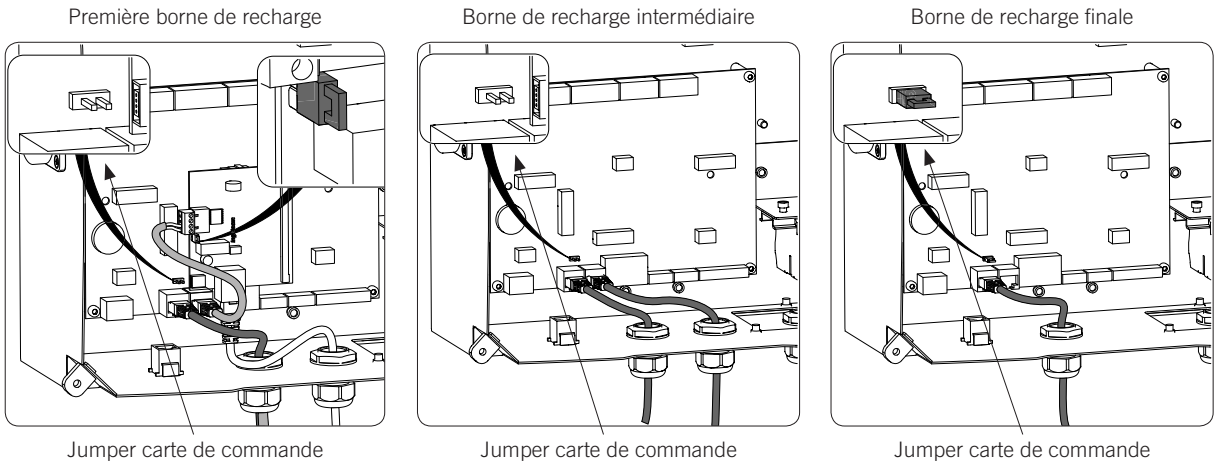
Broche	Couleur	Signal
1	Blanc/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

Raccorder le modem à la carte de communication (voir le câble blanc sur l'illustration suivante).

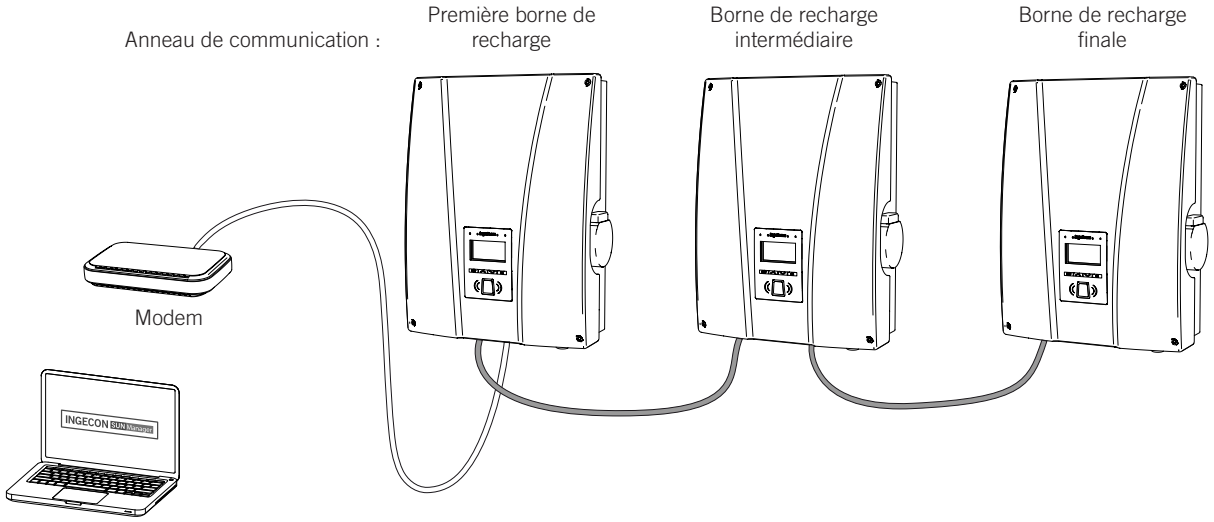
Le jumper de la carte de communication doit rester installé.



3. Connecter les autres bornes de recharge comme indiqué sur les illustrations suivantes :


Première borne de recharge
Borne de recharge intermédiaire
Borne de recharge finale
Jumper carte de commande
Jumper carte de commande
Jumper carte de commande

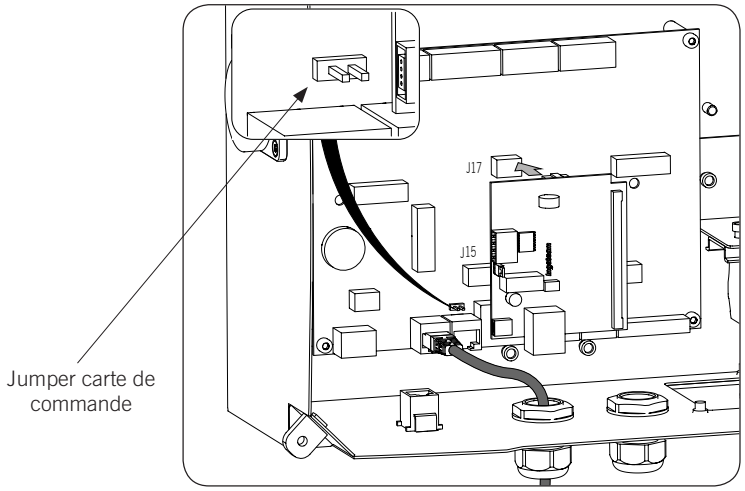
Le jumper de la carte de commande devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.



Un maximum de 10 équipements pourra être raccordé.

4.3.2. Communication à distance GPRS/3G par modem USB

1. Raccorder la carte de communication à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. Elle peut être raccordée, aussi bien aux connecteurs J15 et J17 que J16 et J18.



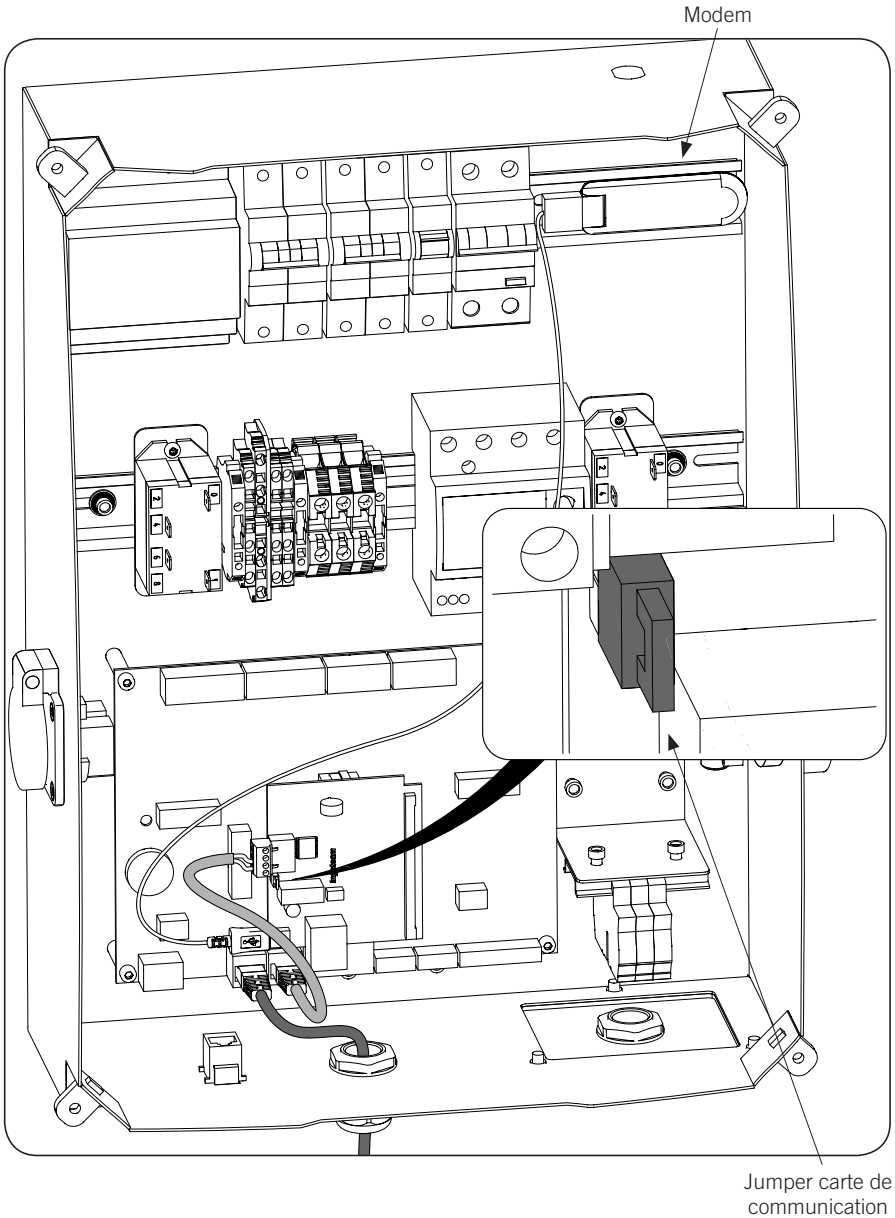
Désinstaller le jumper de fin de ligne de la carte de commande et raccorder la borne de recharge à la suivante constituant l'anneau de communication (câble gris foncé sur l'illustration précédente).

2. Raccorder la carte de commande à celle de communication (voir le câble gris clair sur l'illustration suivante).

Broche	Couleur	Signal
1	Blanc/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

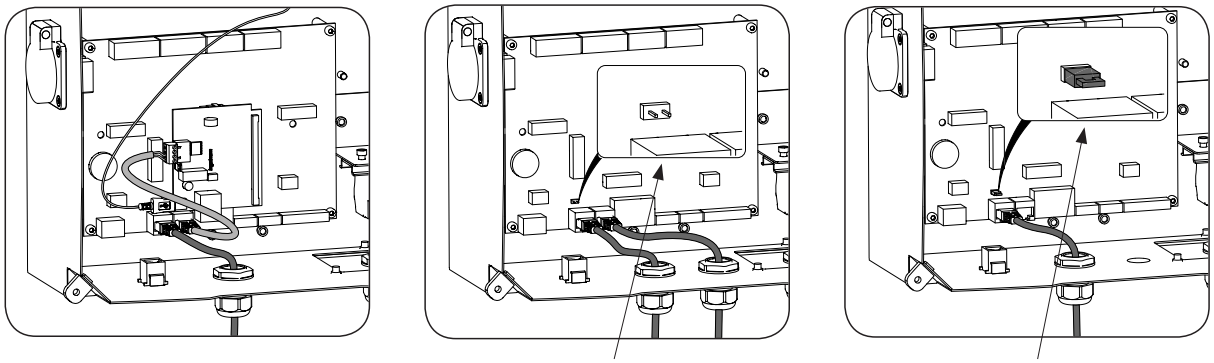
Raccorder le modem USB à la carte de communication afin d'obtenir une connexion GPRS/3G (voir le câble blanc sur l'illustration suivante).

Le jumper de la carte de communication doit rester installé.



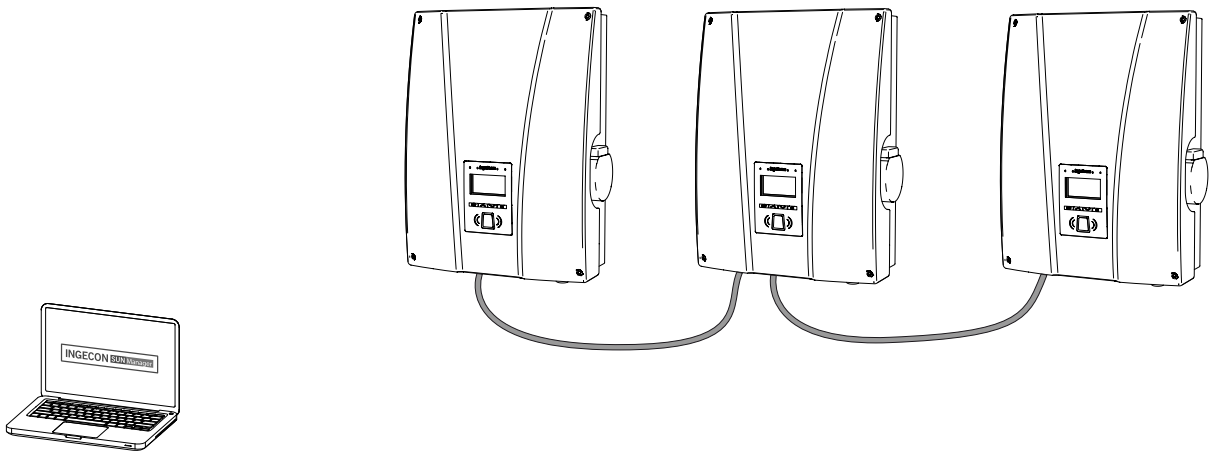
3. Connecter les autres bornes de recharge comme indiqué sur les illustrations suivantes :

Première borne de recharge | Borne de recharge intermédiaire | Borne de recharge finale



Le jumper de la carte de commande devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.

Anneau de communication : Première borne de recharge | Borne de recharge intermédiaire | Borne de recharge finale

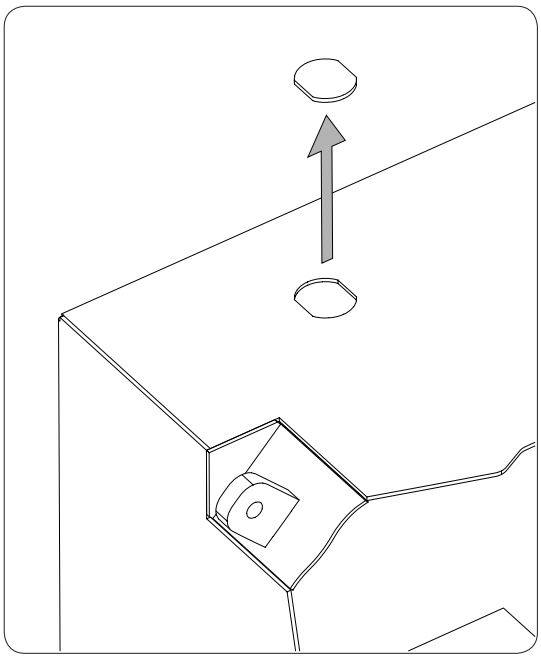


Un maximum de 10 équipements pourra être raccordé.

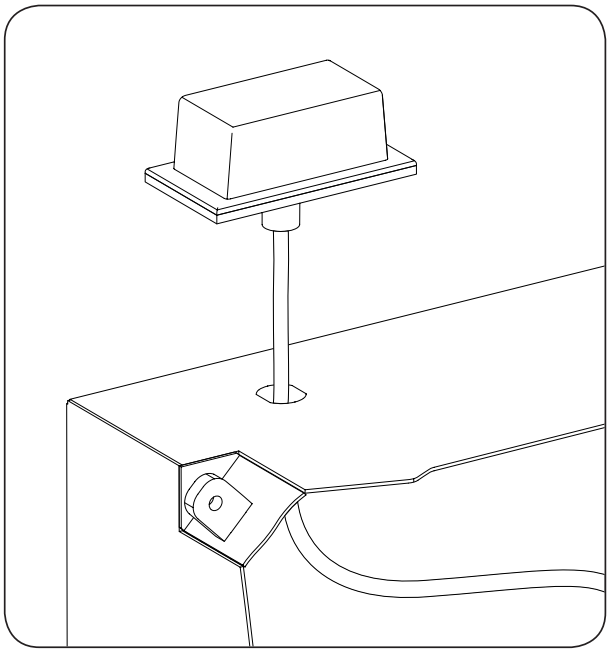
Antenne pour modem USB

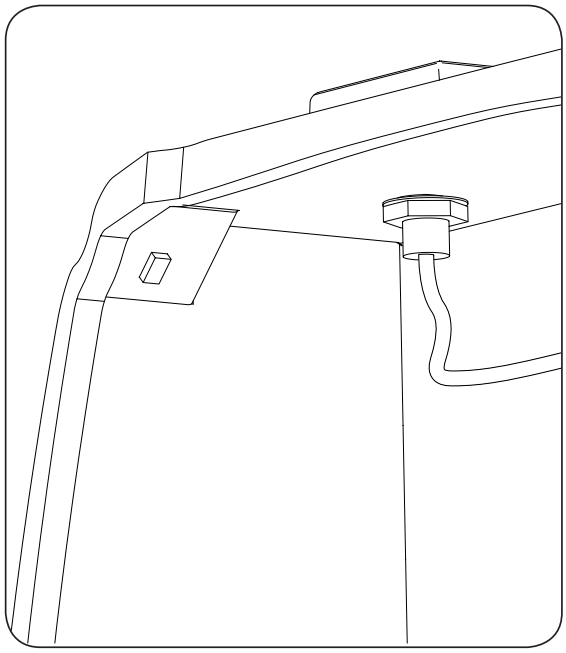
En option, une antenne extérieure pour renforcer le signal du modem peut être demandée. Le processus de connexion est indiqué ci-après.

1. Retirer le prédécoupé du haut de la borne de recharge.



2. Introduire le câblage de l'antenne par l'orifice et fixer l'antenne à la borne de recharge avec l'écrou fourni.





3. Raccorder le câblage de l'antenne au modem.

5. INGEREV CITY

5.1. Communication locale

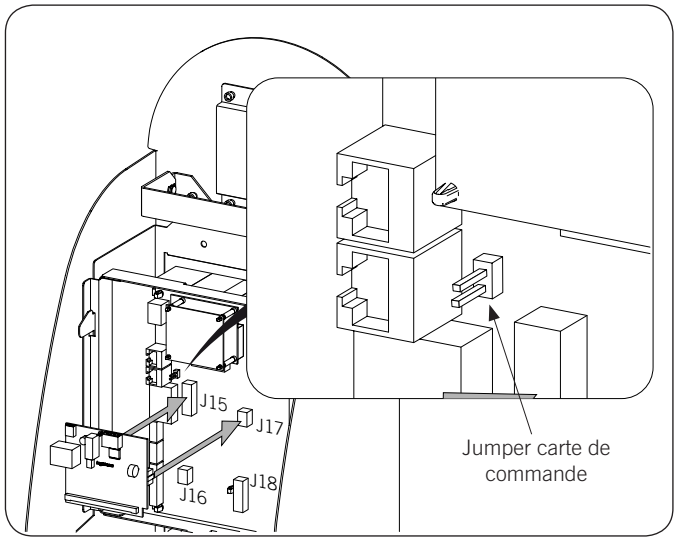
Les bornes de recharge INGEREV GARAGE sont équipées d'un bus de données RS-485 permettant la connexion entre différentes bornes de recharge. Pour de plus amples informations, consulter le guide d'installation correspondant.

5.2. Communication à distance

5.2.1. Communication à distance par modem externe

1. Raccorder la carte de communication avec connexion Ethernet à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. Elle peut être raccordée, aussi bien aux connecteurs J15 et J17 que J16 et J18.

Désinstaller le jumper de fin de ligne de la carte de commande :



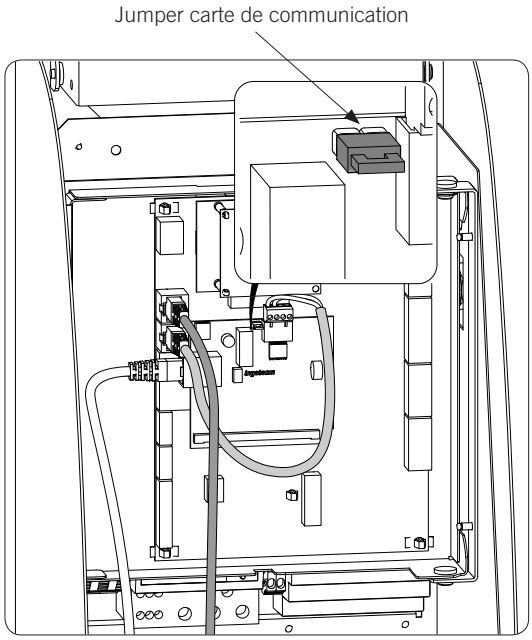
2. Raccorder la carte de commande à celle de communication (voir le câble gris clair sur l'illustration suivante).

Broche	Couleur	Signal
1	Blanc/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

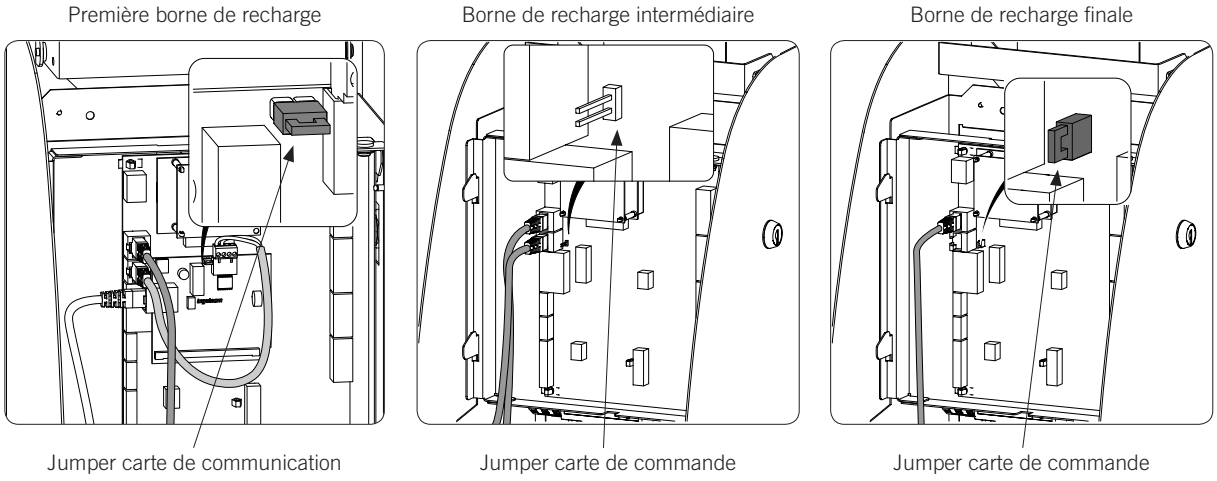
Raccorder le modem à la carte de communication (voir le câble blanc sur l'illustration suivante).

La borne de recharge sera raccordée à la suivante constituant l'anneau de communication par le connecteur RJ45 libre (voir le câble gris foncé sur l'illustration suivante).

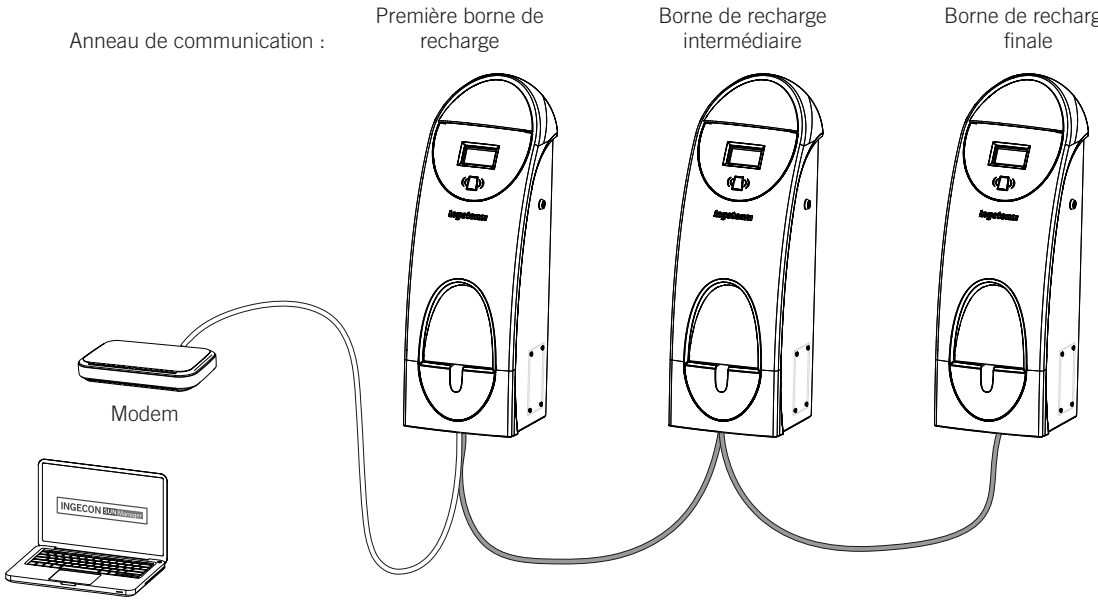
Le jumper de la carte de communication doit rester installé.



3. Connecter les autres bornes de recharge comme indiqué sur les illustrations suivantes :


Première borne de recharge
Borne de recharge intermédiaire
Borne de recharge finale
Jumper carte de communication
Jumper carte de commande
Jumper carte de commande

Le jumper de la carte de commande devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.

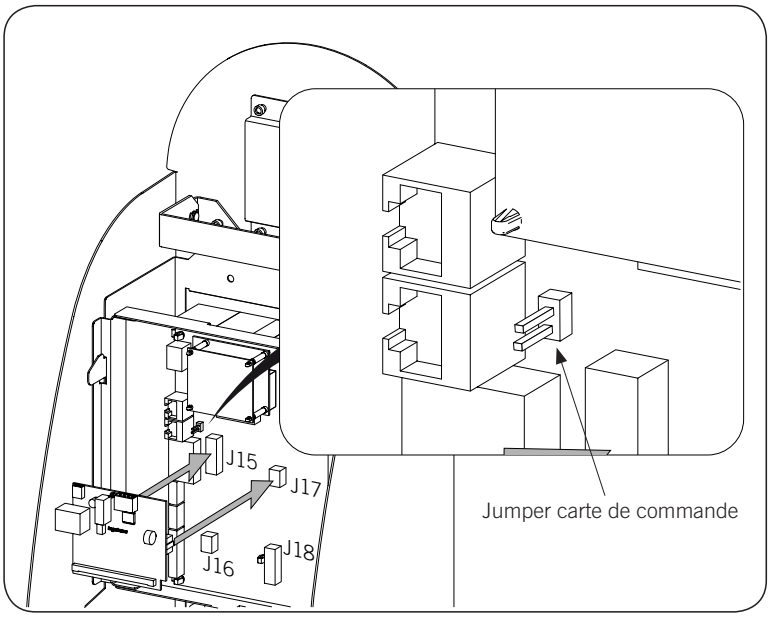


Un maximum de 10 équipements pourra être raccordé.

5.2.2. Communication à distance GPRS/3G par modem USB

1. Raccorder la carte de communication à l'une des bornes de recharge située à une extrémité de l'installation pour commencer l'anneau de communication. Elle peut être raccordée, aussi bien aux connecteurs J15 et J17 que J16 et J18.

Désinstaller le jumper de fin de ligne de la carte de commande :



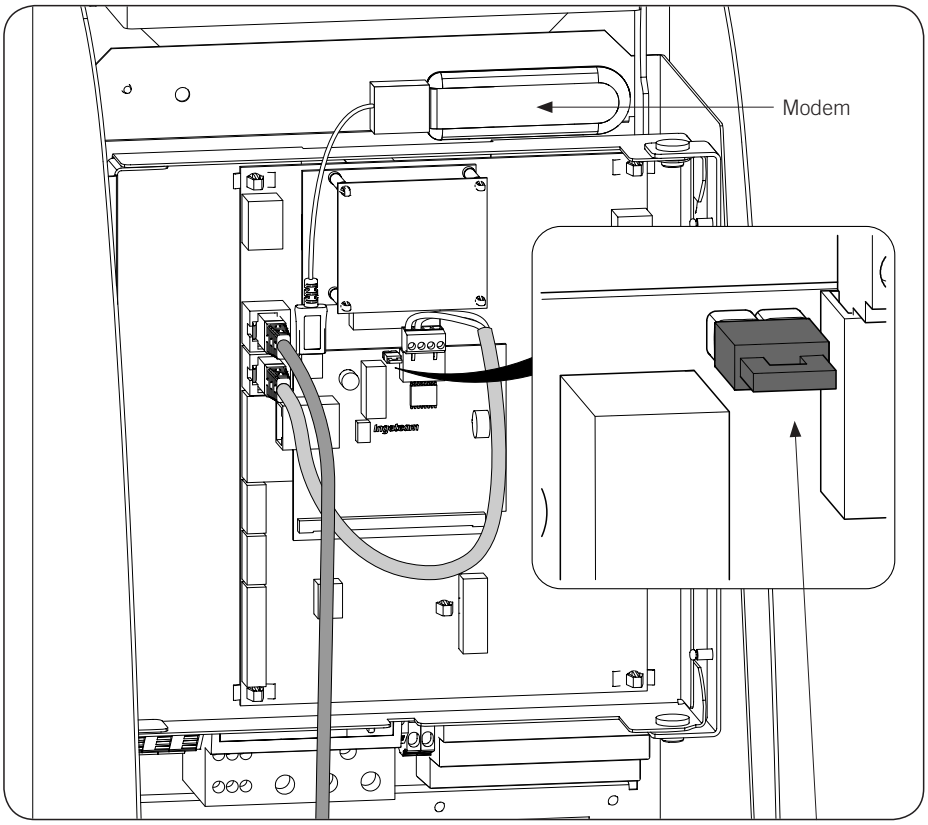
2. Raccorder la carte de commande à celle de communication (voir le câble gris clair sur l'illustration suivante).

Broche	Couleur	Signal
1	Blanc/Orange	RS-485 B (+)
2	Orange	RS-485 A (–)

Raccorder le modem USB à la carte de communication afin d'obtenir une connexion GPRS/3G (voir le câble blanc sur l'illustration suivante).

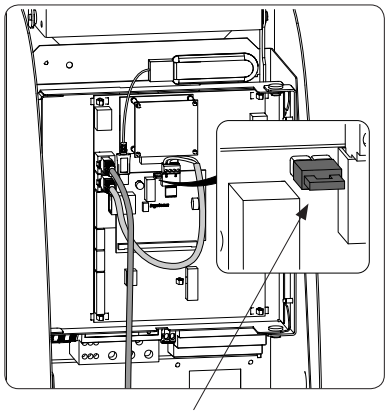
La borne de recharge sera raccordée à la suivante constituant l'anneau de communication par le connecteur RJ45 libre (voir le câble gris foncé sur l'illustration suivante).

Le jumper de la carte de communication doit rester installé.

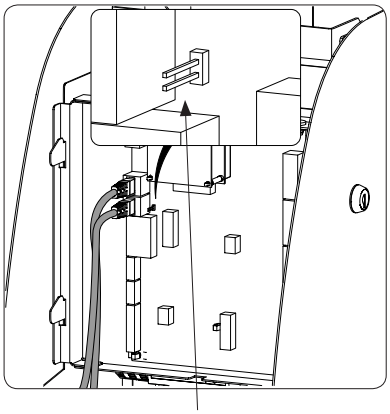


3. Connecter les autres bornes de recharge comme indiqué sur les illustrations suivantes :

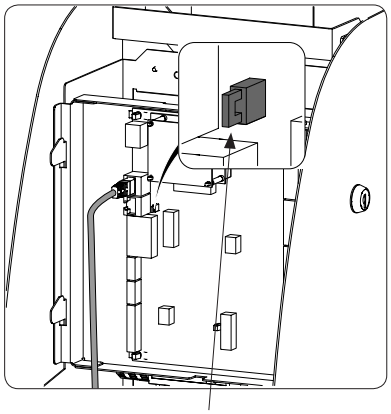
Première borne de recharge



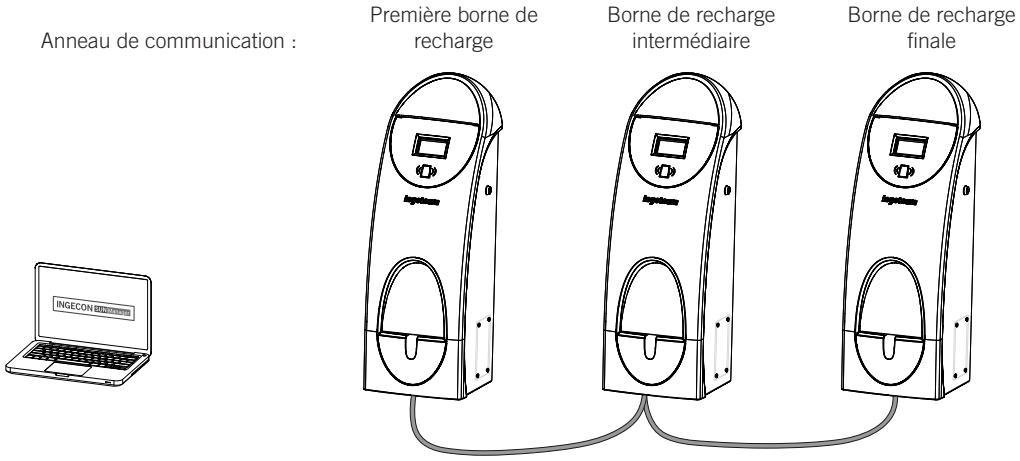
Borne de recharge intermédiaire



Borne de recharge finale



Le jumper de la carte de commande devra être désinstallé sur toutes les bornes de recharge, sauf sur la dernière de l'anneau de communication, où il devra rester installé.



Un maximum de 10 équipements pourra être raccordé.

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5.2.2. Comunicazione remota GPRS/3G tramite modem USB 106

1. Informazioni su questo manuale

Lo scopo del presente manuale è quello di descrivere la comunicazione nella stazioni di ricarica INGEREV
L'accesso a tutte le stazioni di ricarica può avvenire in modo locale o remoto, utilizzando in quest'ultimo caso un modem esterno proprio dell'impianto o mediante un modem USB se così stato richiesto.

La configurazione e il monitoraggio di tutte le stazioni avviene tramite il software INGECON SUN Manager, fornito da Ingeteam.

1.1. Campo di applicazione

Il presente manuale è valido per tutti i modelli delle seguenti famiglie INGEREV:

INGEREV GARAGE Basic

INGEREV GARAGE

INGEREV CITY

1.2. Destinatari

Il presente documento è rivolto a personale qualificato.

Quando nel presente manuale si parla di personale qualificato, si fa riferimento a personale che risponde a tutte le norme, le direttive e le leggi in materia di sicurezza, applicabili agli interventi di installazione e funzionamento di tutti gli elementi dell'impianto.

L'esecuzione di qualsiasi operazione da parte di personale non autorizzato da Ingeteam può comportare la perdita della garanzia originale del dispositivo.

La selezione del personale qualificato è sempre responsabilità della società della quale tale personale fa parte, in quanto la società in questione decide se un lavoratore è adatto o meno a svolgere un determinato lavoro, tutelandone così la sicurezza e rispettando la legge applicabile in materia di sicurezza sul lavoro.

Tali società devono impartire una formazione adeguata sui dispositivi elettrici al proprio personale, e fare in modo che questo prenda dimestichezza con il contenuto del presente manuale.

1.3. Simbologia

Nel presente manuale sono utilizzati diversi simboli, per sottolineare e mettere in evidenza determinate indicazioni. Di seguito ne viene spiegato il significato generale.

Attenzione generale.

Consultare la sezione indicata.

Rischio elettrico.

Divieto.

2. Sicurezza

In questa sezione sono descritti gli avvisi di sicurezza e il dispositivo di protezione individuale.

2.1. Condizioni di sicurezza

Avvisi generali

Le operazioni riportate nel presente manuale possono essere eseguite solo da personale debitamente qualificato.

Quando nel presente manuale si parla di personale qualificato, si fa riferimento a personale che risponde a tutte le norme, le direttive e le leggi in materia di sicurezza, applicabili agli interventi di installazione e funzionamento di questo dispositivo.

È obbligatorio rispettare la legge applicabile in materia di sicurezza per quanto riguarda i lavori elettrici. Esiste il pericolo di possibili scosse elettriche.

Il rispetto delle istruzioni di sicurezza esposte nel presente manuale o della legislazione indicata, non esime dal rispetto di altre norme specifiche relative a installazione, luogo, Paese o altre circostanze che riguardino il dispositivo.

L'apertura dell'involucro non implica l'assenza di tensione all'interno.

Esiste pericolo di possibili scosse elettriche anche dopo il disinserimento di tutte le fonti di energia del sistema.

Può essere aperta solo da personale qualificato seguendo le istruzioni riportate nel presente manuale.

È obbligatorio leggere e comprendere completamente il presente manuale prima di cominciare a manipolare, installare o utilizzare l'unità.

La normativa di sicurezza di base obbligatoria per ogni Paese è la seguente:

- *RD 614/2001* in Spagna.
- *CEI 11-27* in Italia.
- *DIN VDE 0105-100* e *DIN VDE 1000-10* in Germania.
- *UTE C18-510* in Francia.

Per verificare l'assenza di tensione, è obbligatorio usare dispositivi di misurazione che rientrano nella categoria III-1000 Volt.

Ingeteam declina ogni responsabilità per i danni eventualmente causati da un uso inadeguato dei dispositivi. Ogni intervento realizzato su uno qualsiasi dei dispositivi e che comporti una modifica dell'assetto elettrico originale, deve essere previamente autorizzato da Ingeteam. Le proposte devono essere esaminate e approvate da Ingeteam.

Per qualsiasi manovra e intervento, l'impianto deve essere disinserito dalla tensione.

Come misura minima di sicurezza per questa operazione occorre rispettare le cosiddette **5 regole d'oro**:

1. Disinserire.
2. Prevenire qualsiasi eventuale reinserimento dell'alimentazione.
3. Verificare l'assenza di tensione.
4. Mettere a terra e in cortocircuito.
5. Proteggersi da elementi in tensione in prossimità ed, eventualmente, collocare segnali di sicurezza per delimitare la zona di lavoro.

Prima del completamento di queste cinque operazioni, la parte interessata dovrà essere considerata in tensione, pertanto l'intervento senza tensione non potrà essere autorizzato.

Potenziali pericoli per il dispositivo

Al fine di proteggere il dispositivo, rispettare le seguenti avvertenze.

Prima dell'inserimento, dopo qualsiasi intervento debitamente autorizzato, verificare che il dispositivo sia pronto per cominciare a funzionare. Successivamente, procedere e collegarlo seguendo le istruzioni del manuale.

Non toccare le schede né i componenti elettronici. I componenti più sensibili potrebbero risultare danneggiati o distrutti dall'elettricità statica.

Non disinserire né collegare alcun terminale mentre il dispositivo è in funzione. Disinserire e verificare l'assenza di tensione prima di eseguire qualsiasi operazione.

2.2. Dispositivo di protezione individuale (DPI)

Quando si lavora sul dispositivo, utilizzare almeno le seguenti dotazioni di sicurezza consigliate da Ingeteam.

Denominazione	Spiegazione
Calzature di sicurezza	In conformità alla norma *UNE-EN-ISO 20345:2012*
Elmetto	Conforme alla norma *EN 397:1995*
Elmetto con maschera per il volto	Conforme alla norma *UNE-EN 166:2002*, se esistono elementi con tensione direttamente accessibili
Indumenti da lavoro	Aderenti, non infiammabili, 100% cotone
Guanti dielettrici	Conforme alla norma *EN 60903:2005*

Le attrezzature e/o i dispositivi utilizzati in attività in tensione devono disporre almeno di isolamento di categoria III-1000 Volt.

Nel caso in cui le normative del luogo di installazione esigano un altro tipo di dispositivo di protezione individuale, è necessario completare in modo adeguato il dispositivo consigliato da Ingeteam.

2.3. Smaltimento dei rifiuti

Una volta conclusa la vita utile, le schede dei circuiti stampati devono essere smaltite presso un gestore autorizzato.

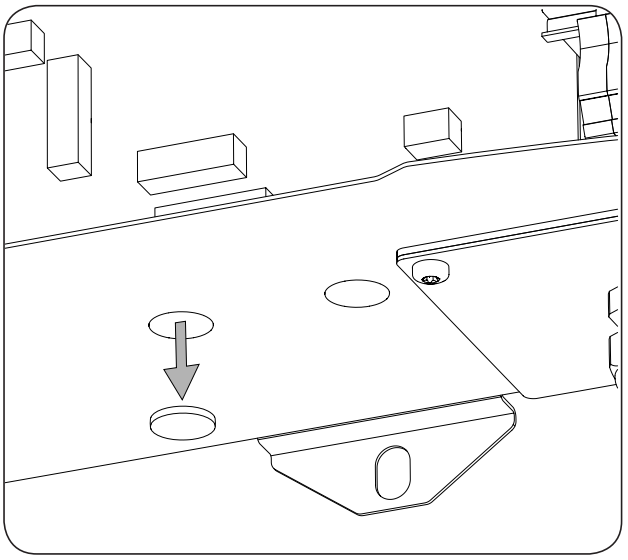
3. INGEREV GARAGE Basic

3.1. Installazione dei pressacavi con filetto PG

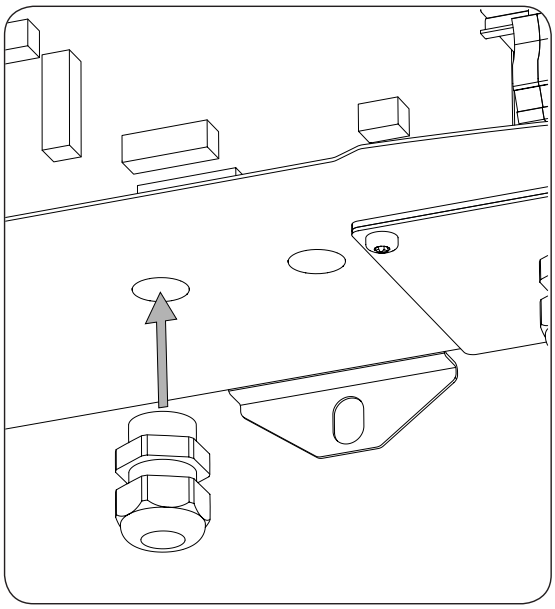
Per l'installazione degli accessori di comunicazione nelle stazioni di ricarica INGEREV GARAGE Basic è necessario installare i pressacavi con filetto PG per eseguire il passaggio dei cavi tra le stazioni.

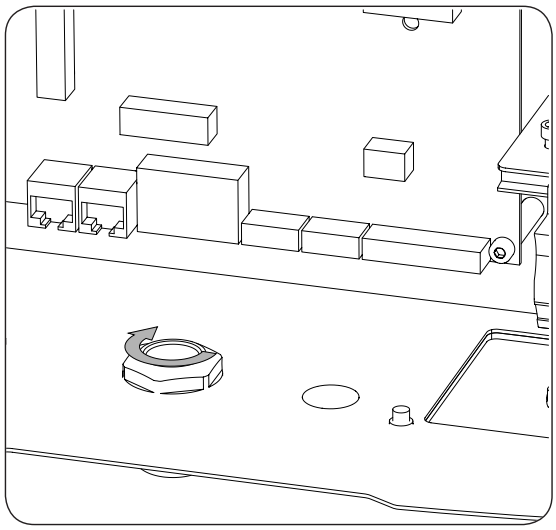
Per installare i pressacavi con filetto PG osservare le seguenti istruzioni:

1. Eliminare uno dei pretagliati della piastra di collegamento inferiore.

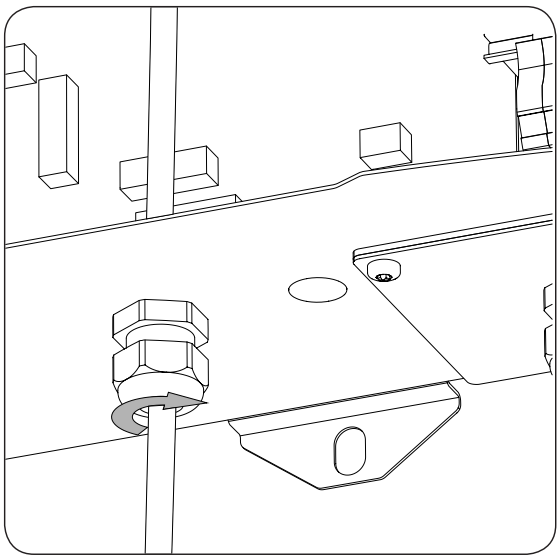


2. Inserire il pressacavo PG nel foro ed avvitare il dado.





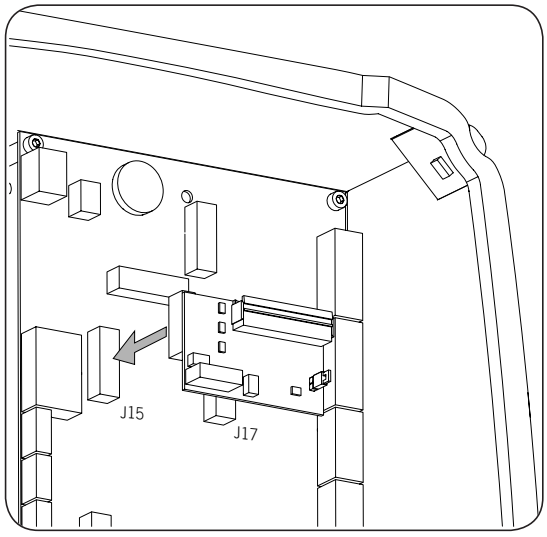
3. Inserire il cablaggio e stringere il pressacavo PG. Lasciare un certo margine affinché il cablaggio non sia in tensione.



3.2. Comunicazione locale

Per eseguire il collegamento locale, procedere come indicato di seguito:

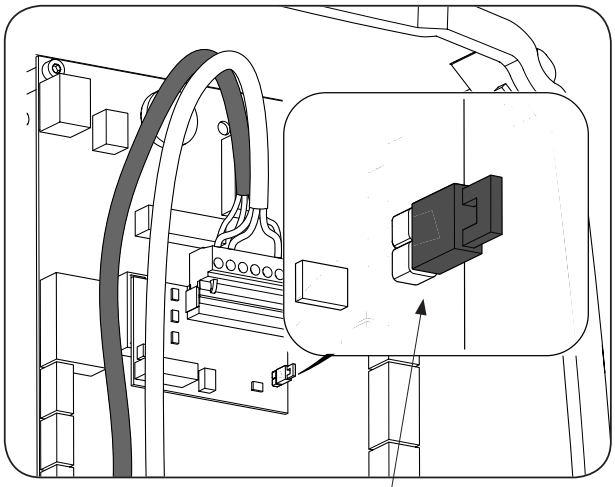
1. Collegare la scheda di comunicazione RS-485 in tutte le stazioni di ricarica che compongono l'anello di comunicazione. Collegare i connettori J15 e J17.

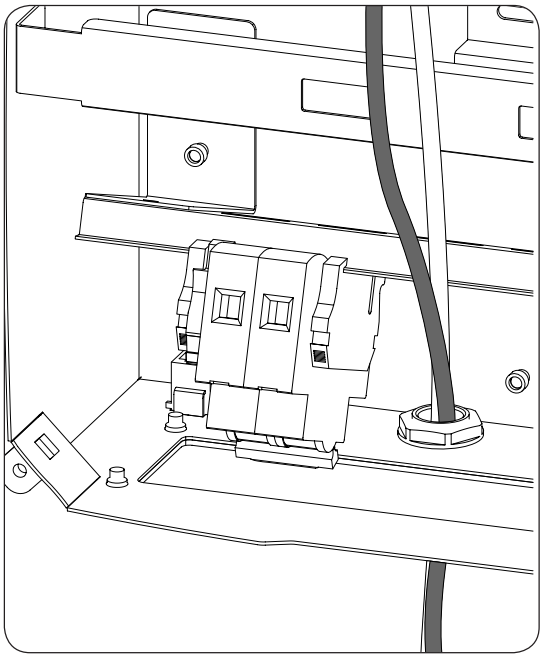


2. Cablare la scheda di comunicazione con la scheda di comunicazione della stazione di ricarica successiva (vedere il cavo grigio scuro nella figura seguente).

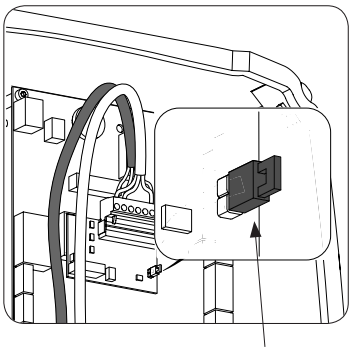
Pin	Segnale
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

Utilizzare un convertitore da USB a RS-485 (non fornito da Ingeteam) per collegare il computer alla prima stazione dell'anello di comunicazione (cavo bianco nella figura seguente).

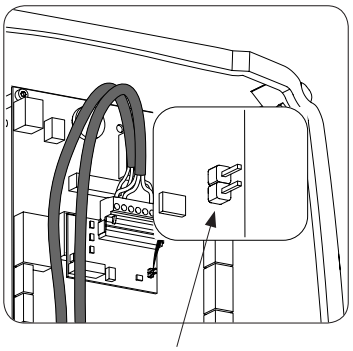




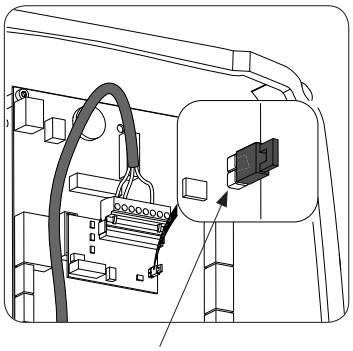
Prima stazione

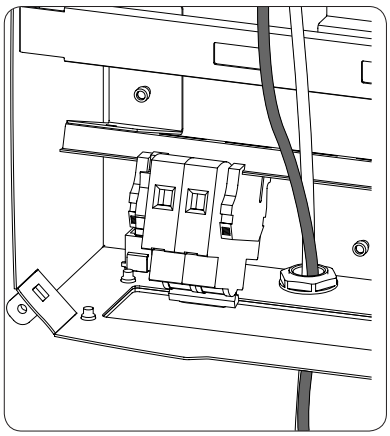


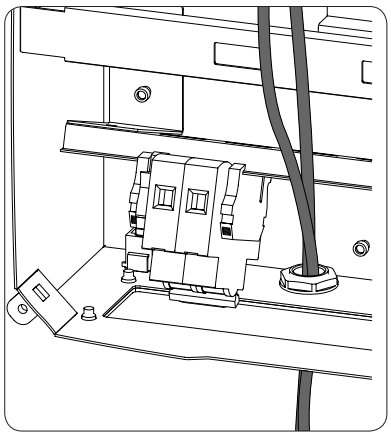
Stazione intermedia

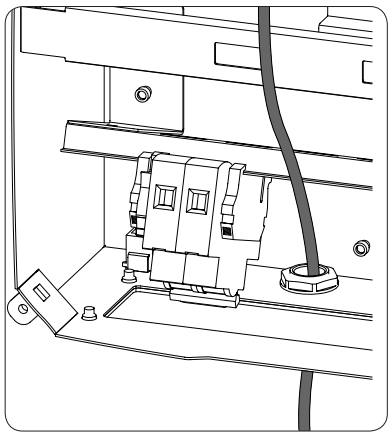


Stazione finale

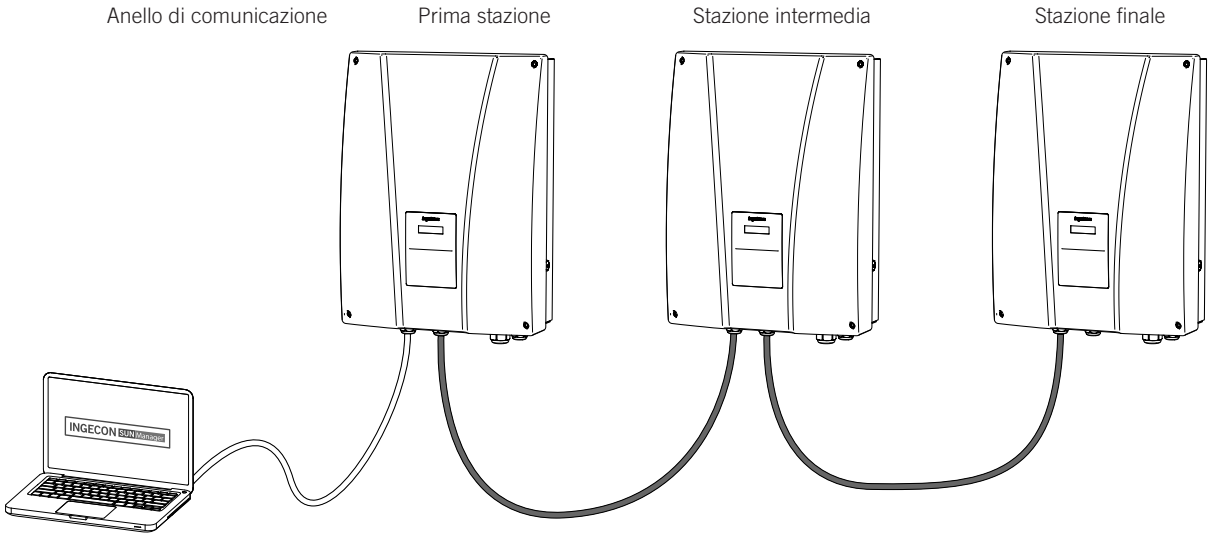








Il jumper delle schede RS-485 deve essere disinstallato in tutte le stazioni intermedie dell'anello di comunicazione.

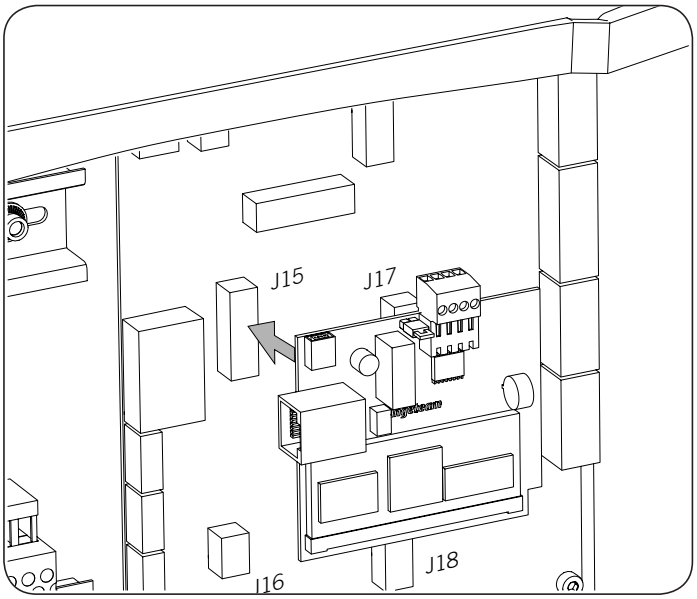


È possibile collegare al massimo 10 dispositivi tra di loro.

3.3. Comunicazione remota

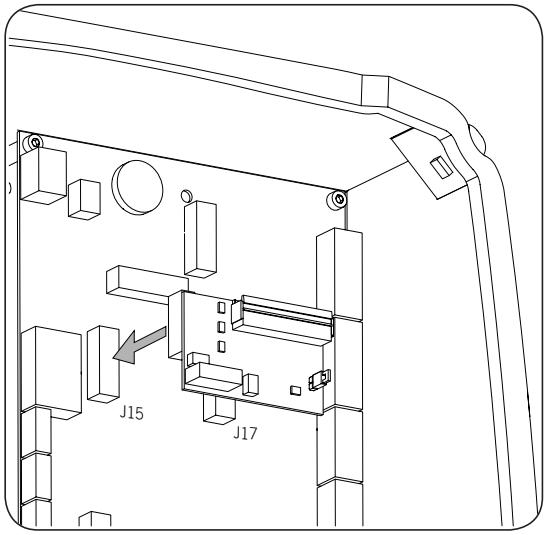
3.3.1. Comunicazione remota tramite modem esterno

1. Collegare la scheda di comunicazione con collegamento Ethernet in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Collegare i connettori J15 e J17.



Pin	Segnale
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Installare le schede di comunicazione RS-485 in tutte le stazioni di ricarica che compongono l'anello di comunicazione. Collegare i connettori J15 e J17.

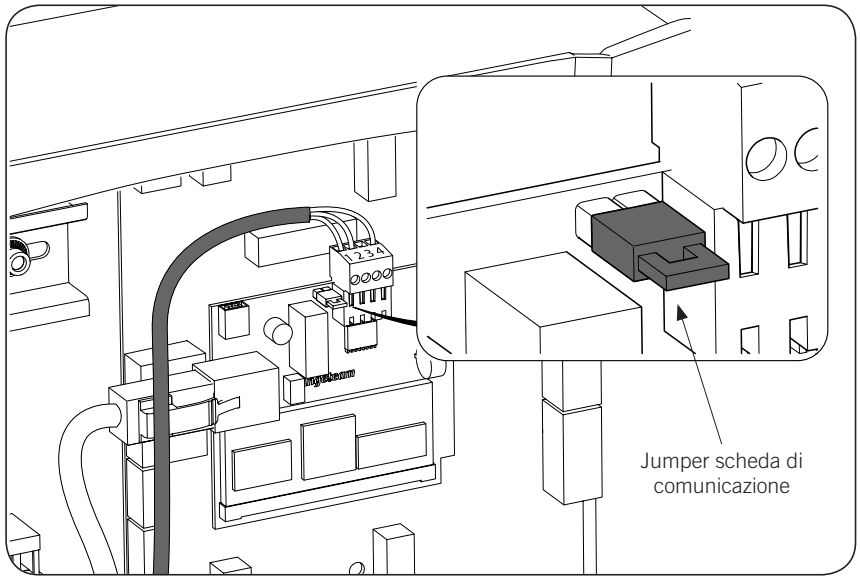


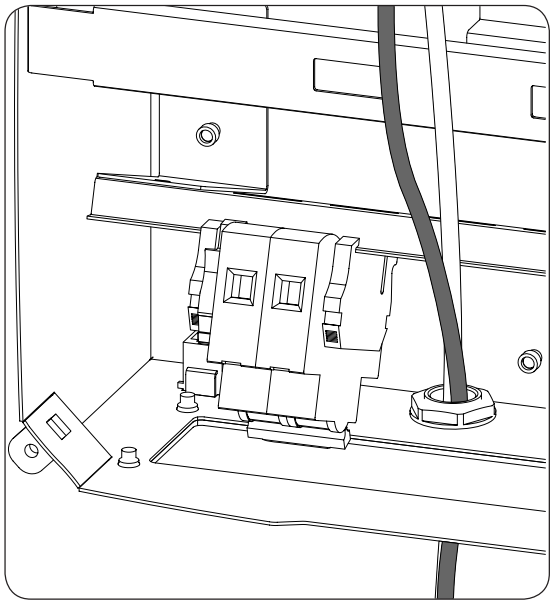
Pin	Segnale
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

3. Cablare la scheda di comunicazione con la scheda di comunicazione della stazione di ricarica successiva (vedere il cavo grigio scuro nella figura seguente).

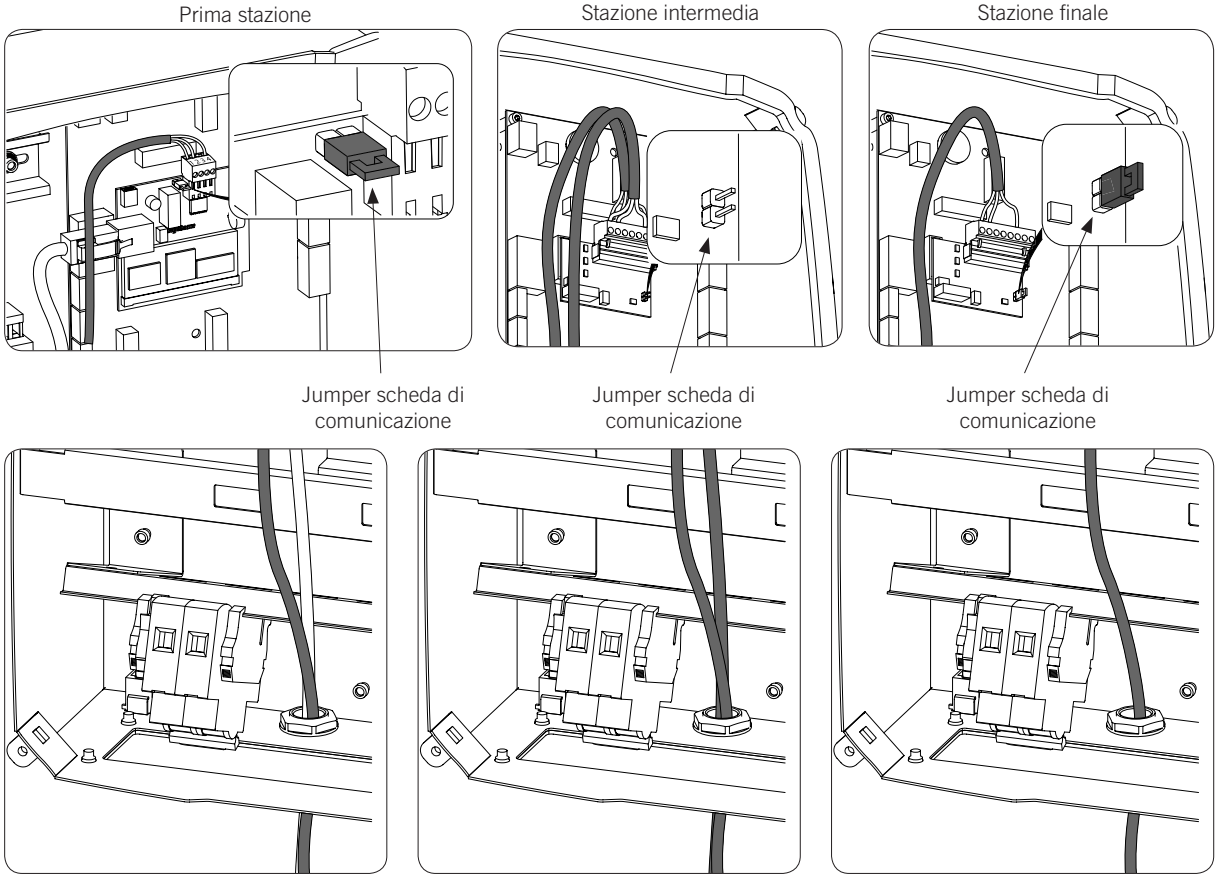
Collegare il modem alla scheda di comunicazione della prima stazione di ricarica (vedere il cavo bianco nella figura seguente).

Il jumper della scheda di comunicazione della prima stazione di ricarica deve restare installato.

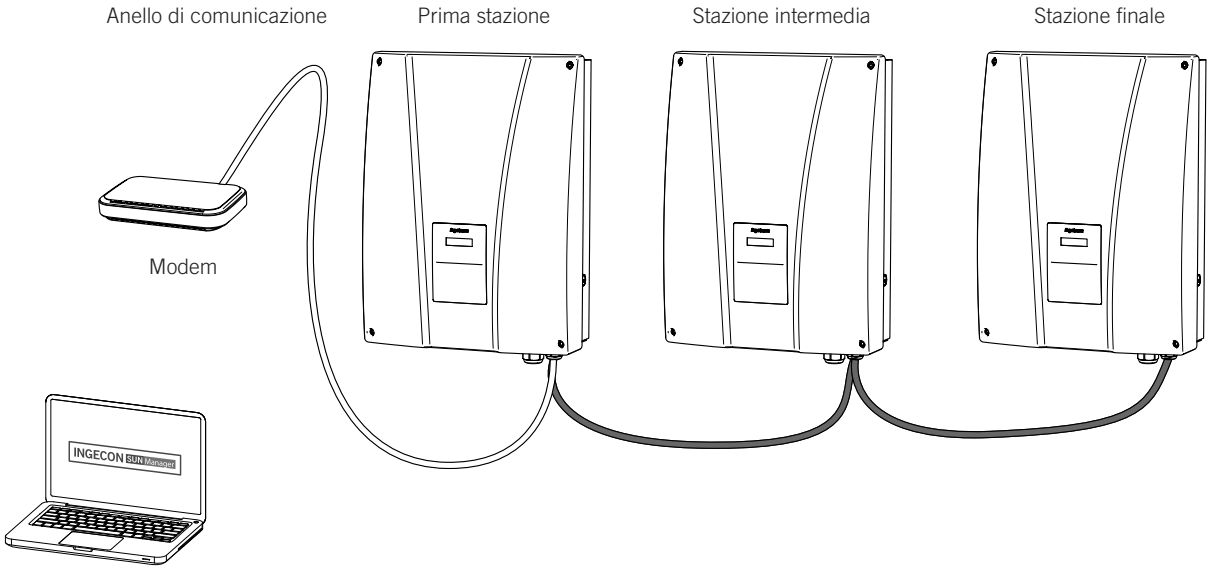




4. Collegare le restanti stazioni di ricarica dell'anello di comunicazione come indicato nella seguente figura.



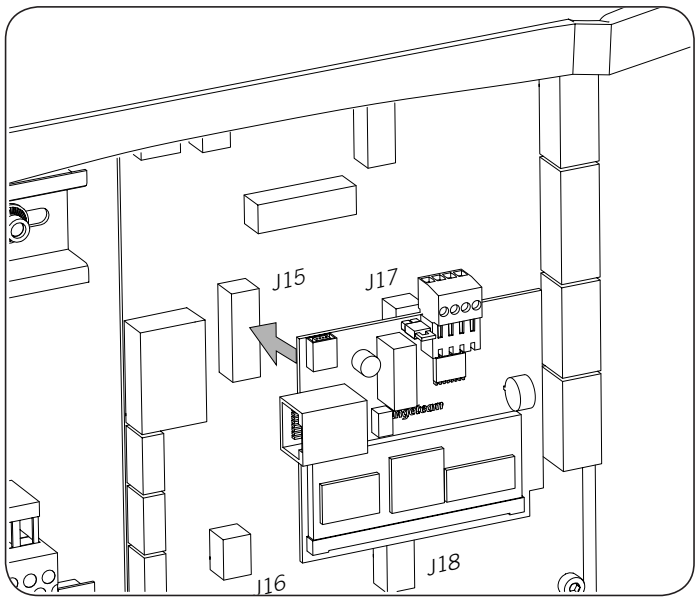
Il jumper delle schede RS-485 deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.



È possibile collegare al massimo 10 dispositivi tra di loro.

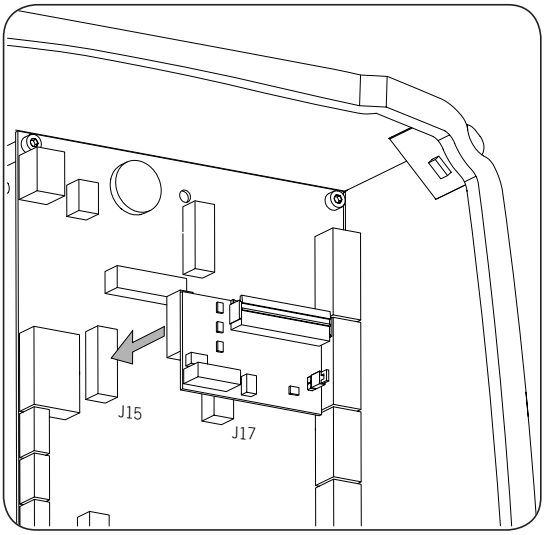
3.3.2. Comunicazione remota GPRS/3G tramite modem USB

1. Collegare la scheda di comunicazione da collegare al modem USB in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Collegare i connettori J15 e J17.



Pin	Segnale
1	RS-485 B (+)
2	RS-485 A (–)
4	GND

2. Installare le schede di comunicazione RS-485 in tutte le stazioni di ricarica che compongono l'anello di comunicazione. Collegare i connettori J15 e J17.

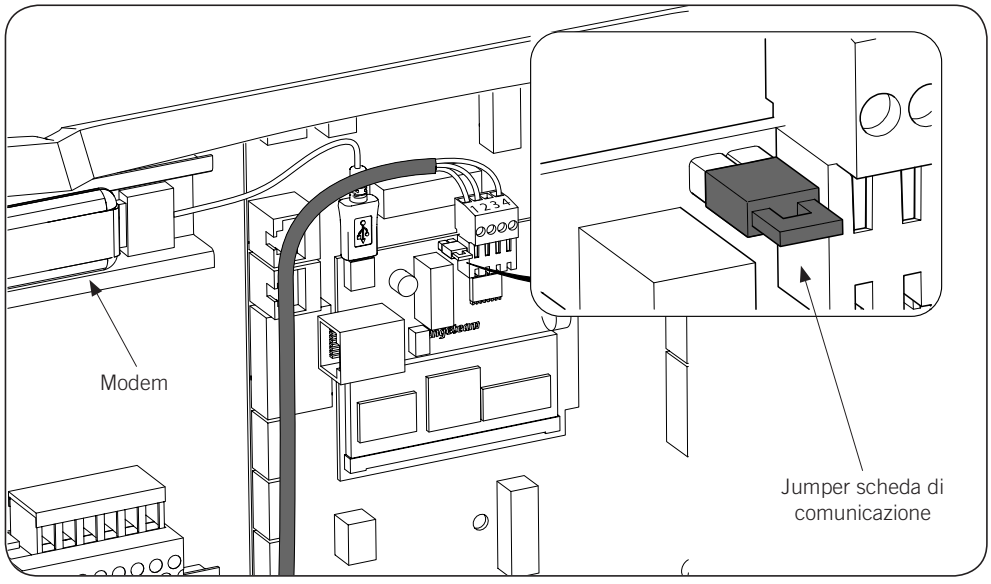


Pin	Segnale
1	RS-485 B (+)
2	RS-485 A (–)
6	GND

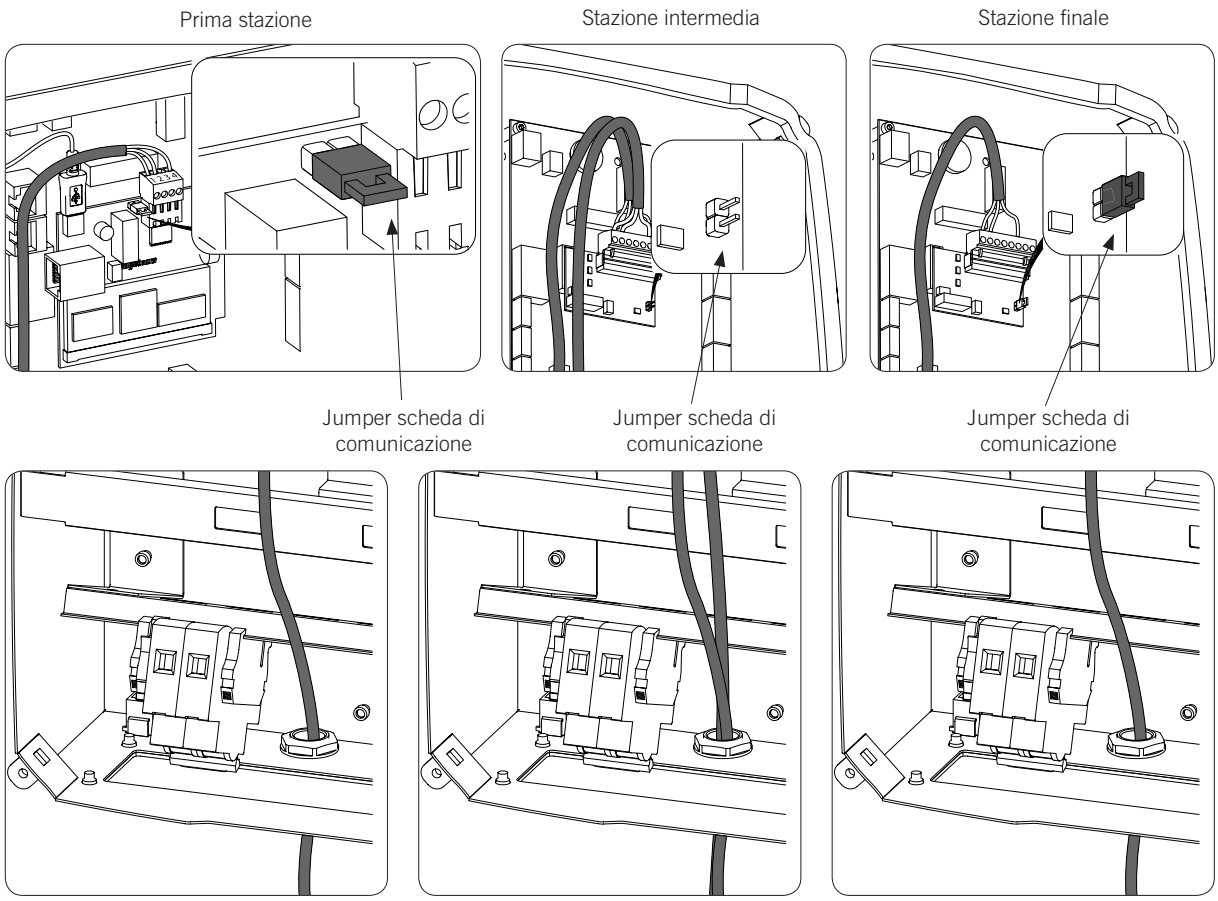
3. Cablare la scheda di comunicazione con la scheda di comunicazione della stazione di ricarica successiva (vedere il cavo grigio scuro nella figura seguente).

Collegare il modem USB alla scheda di comunicazione della prima stazione di ricarica per ottenere il collegamento GPRS/3G.

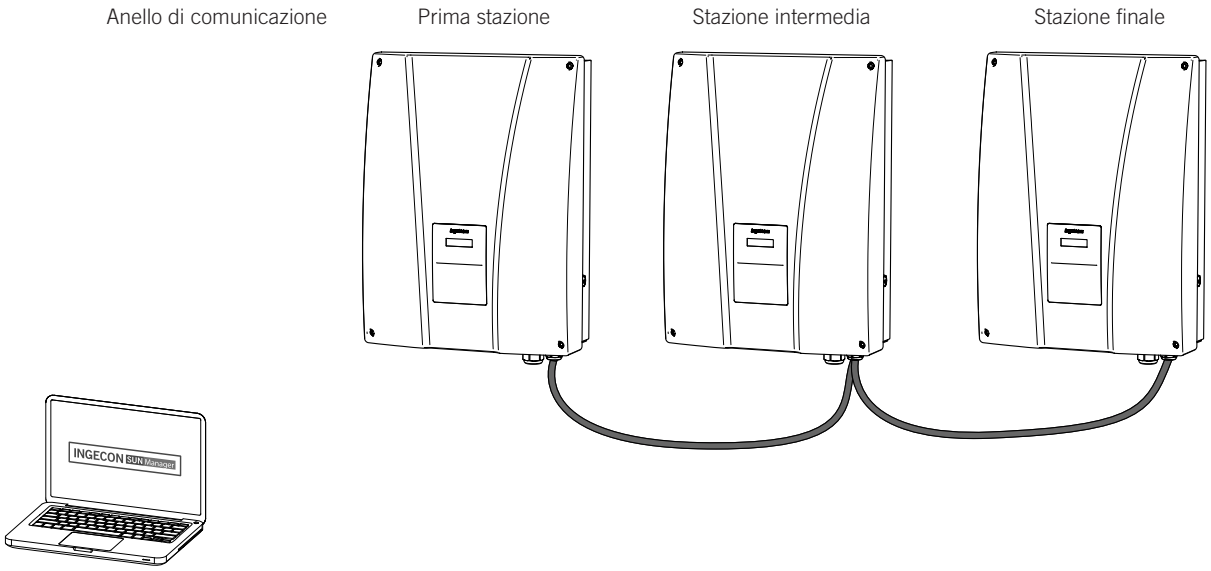
Il jumper della scheda di comunicazione della prima stazione di ricarica deve restare installato.



4. Collegare le restanti stazioni di ricarica come indicato nella seguente figura:



Il jumper delle schede RS-485 deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.

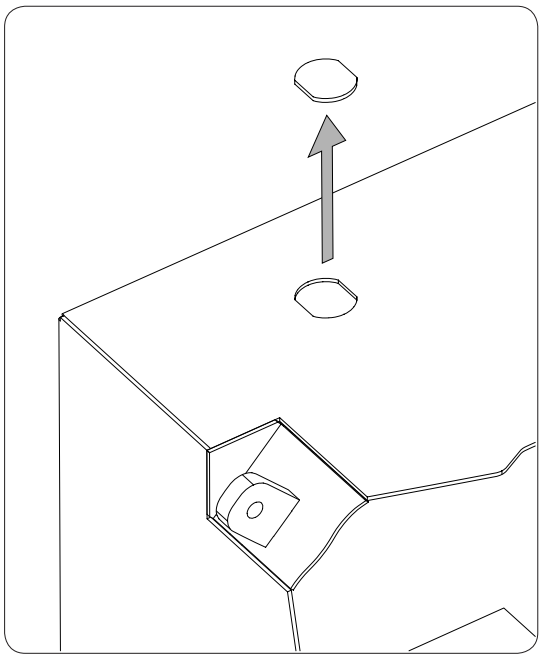


È possibile collegare al massimo 10 dispositivi tra di loro.

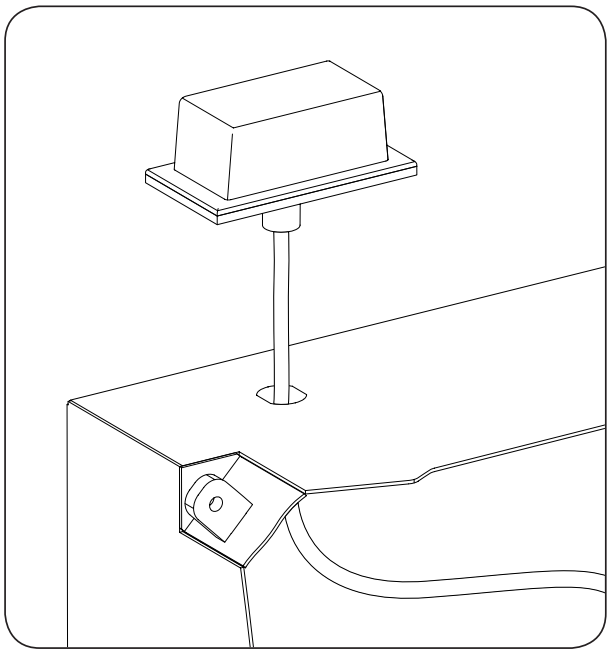
Antenna per modem USB

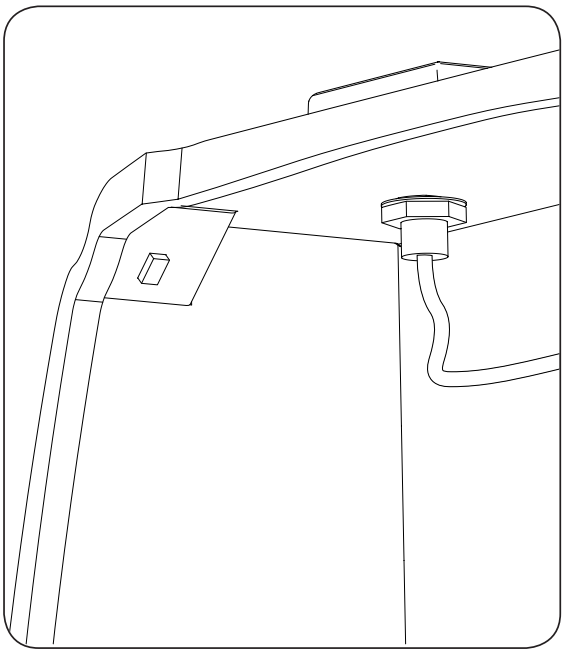
Opzionalmente è possibile richiede un'antenna esterna per ampliare il segnale del modem. Di seguito è indicata la procedura di collegamento.

1. Eliminare il pretagliato della parte superiore della stazione.



2. Inserire il cablaggio dell'antenna attraverso il foro e fissare l'antenna alla stazione tramite il dado in dotazione.





3. Collegare il cablaggio dell'antenna modem.

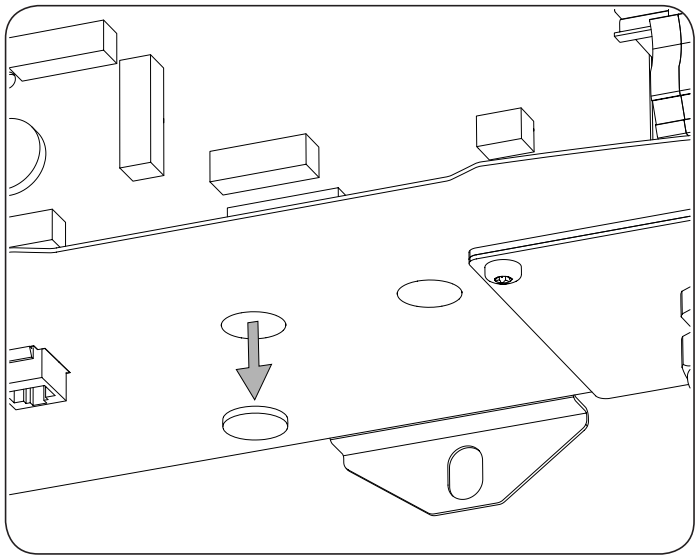
4. INGEREV GARAGE

4.1. Installazione dei pressacavi con filetto PG

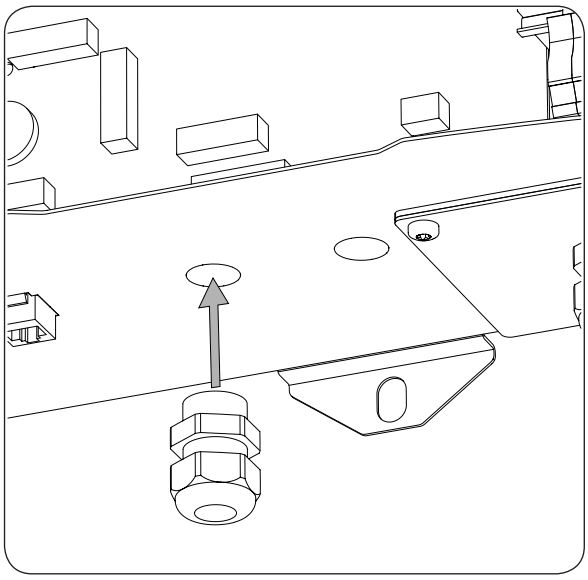
Per l'installazione degli accessori di comunicazione nelle stazioni di ricarica INGEREV GARAGE è necessario installare i pressacavi PG per eseguire il passaggio dei cavi tra le stazioni.

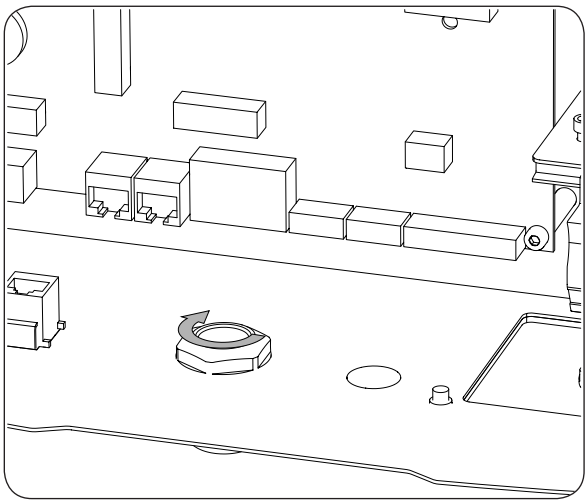
Per installare i pressacavi con filetto PG osservare le seguenti istruzioni:

1. Eliminare uno dei pretagliati della piastra di collegamento inferiore.

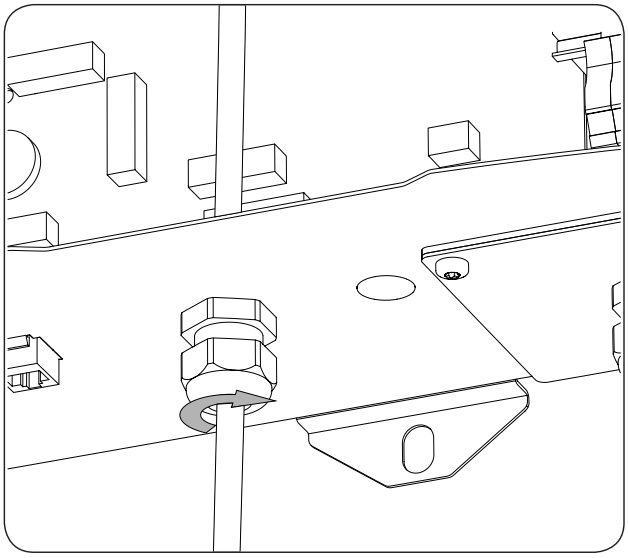


2. Inserire il pressacavo PG nel foro ed avvitare il dado.





3. Inserire il cablaggio e stringere il pressacavo PG. Lasciare un certo margine affinché il cablaggio non sia in tensione.

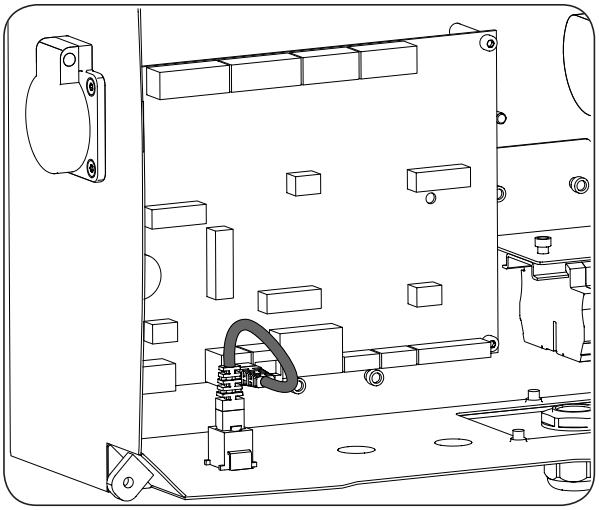


4.2. Comunicazione locale

Le stazioni di ricarica INGEREV GARAGE presentano un bus dati RS-485 locale con connettore RJ45 che consente il collegamento tra diverse stazioni. Per ulteriori informazioni, consultare il relativo manuale di installazione.

4.3. Comunicazione remota

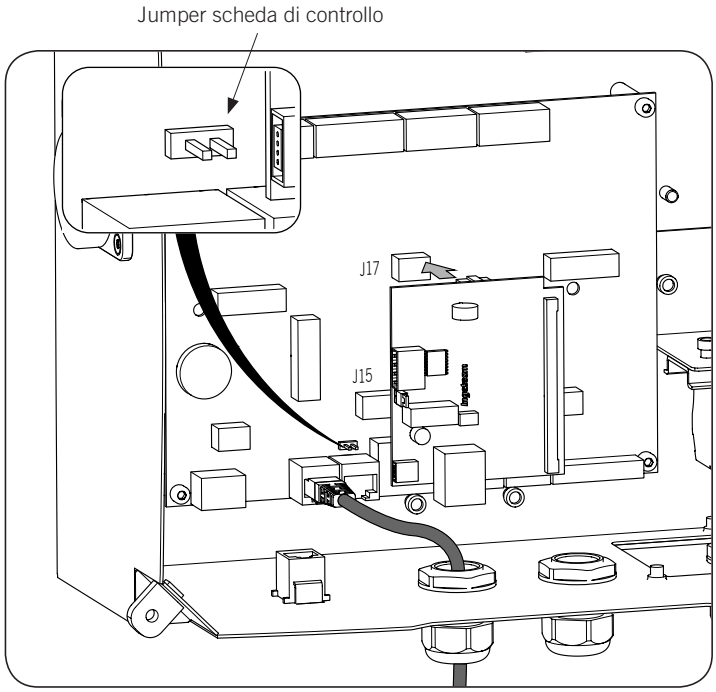
Per eseguire una comunicazione remota via Ethernet o tramite modem USB nelle stazioni di ricarica INGEREV GARAGE è necessario togliere il cavo mostrato nella seguente figura. Tale cavo è inserito per la comunicazione locale.



4.3.1. Comunicazione remota tramite modem esterno

1. Collegare la scheda di comunicazione con collegamento Ethernet in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Può essere collegata sia nei connettori J15 e J17 che nei connettori J16 e J18.

Disinstallare il jumper del fine linea della scheda di controllo e collegare la stazione di ricarica con la stazione seguente nell'anello di comunicazione (cavo grigio scuro nella figura seguente).

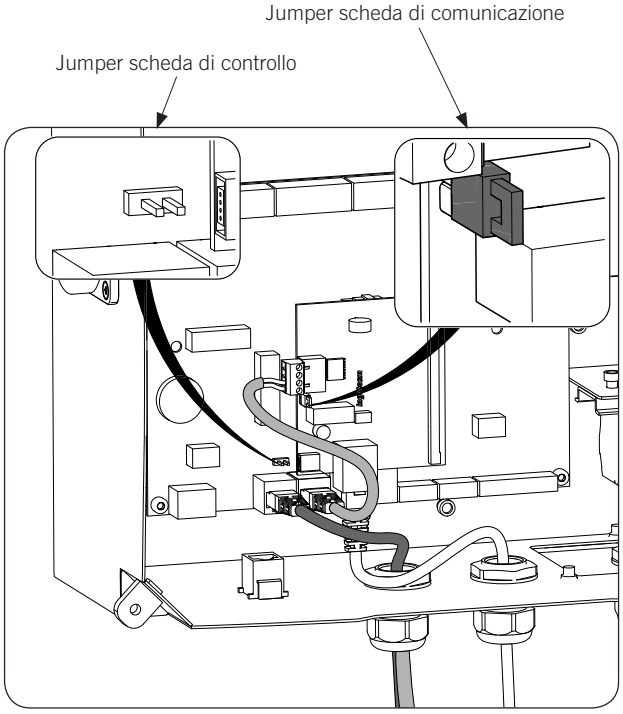


2. Collegare il cablaggio che unisce la scheda di controllo con la scheda di comunicazione (vedere il cavo grigio chiaro nella figura seguente).

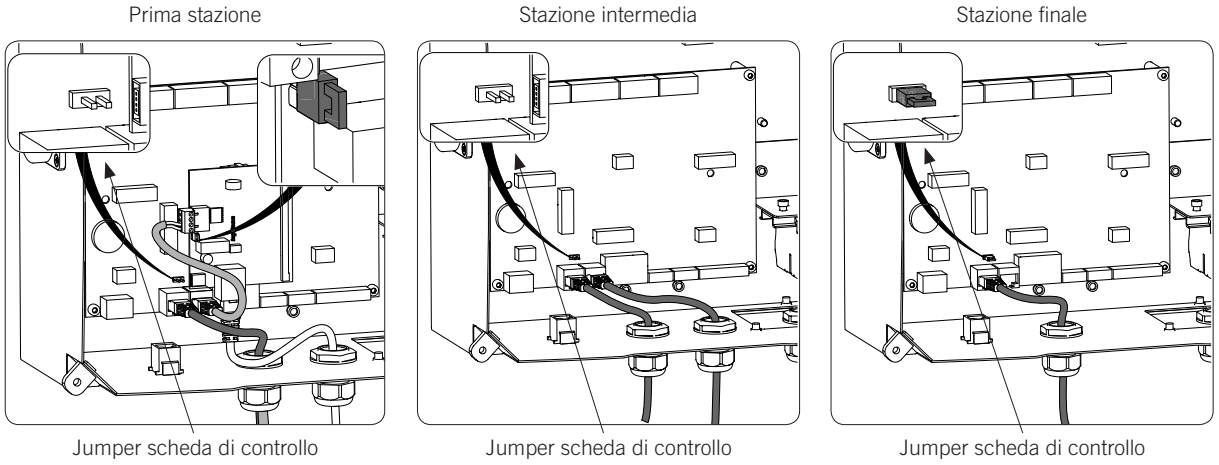
Pin	Colore	Segnale
1	Bianco/Arancione	RS-485 B (+)
2	Arancione	RS-485 A (–)

Collegare il modem alla scheda di comunicazione (vedere il cavo bianco nella figura seguente).

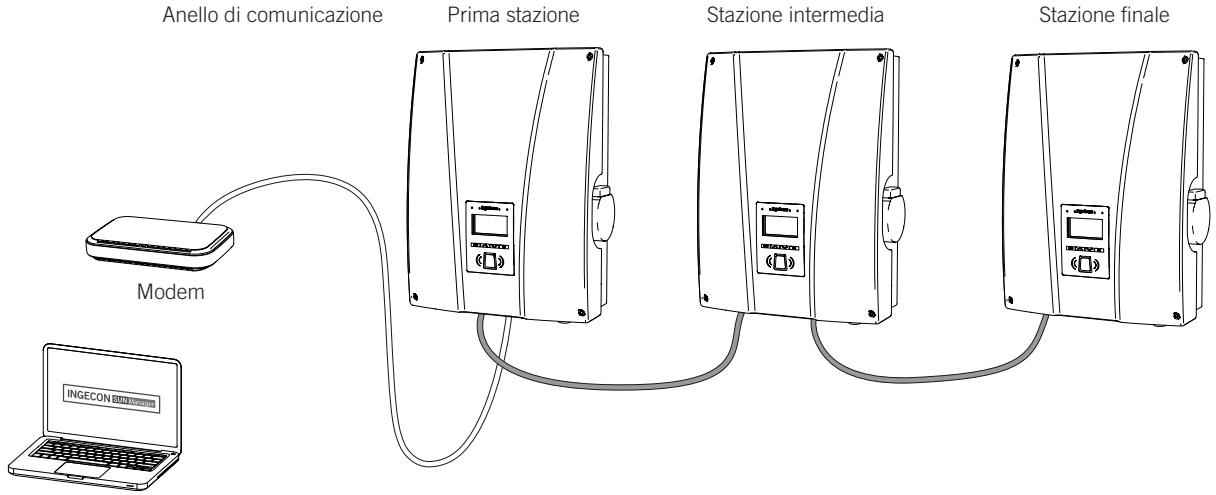
Il jumper della scheda di comunicazione deve restare installato.



3. Collegare le restanti stazioni di ricarica come indicato nella seguente figura:



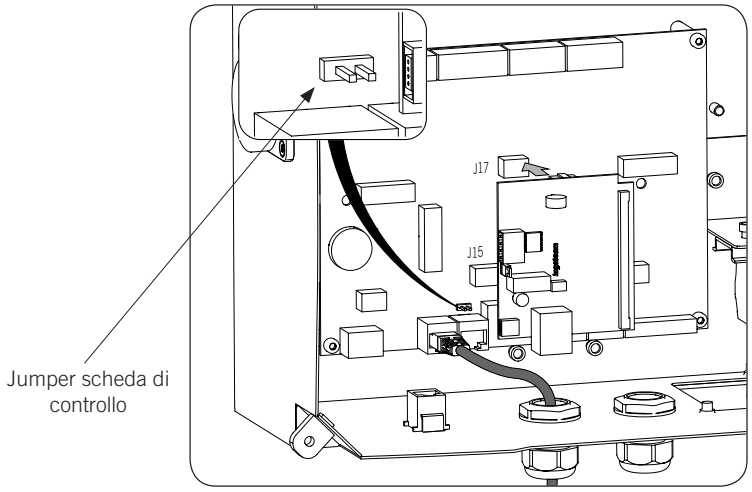
Il jumper della scheda di controllo deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.



È possibile collegare al massimo 10 dispositivi tra di loro.

4.3.2. Comunicazione remota GPRS/3G tramite modem USB

1. Collegare la scheda di comunicazione in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Può essere collegata sia nei connettori J15 e J17 che nei connettori J16 e J18.



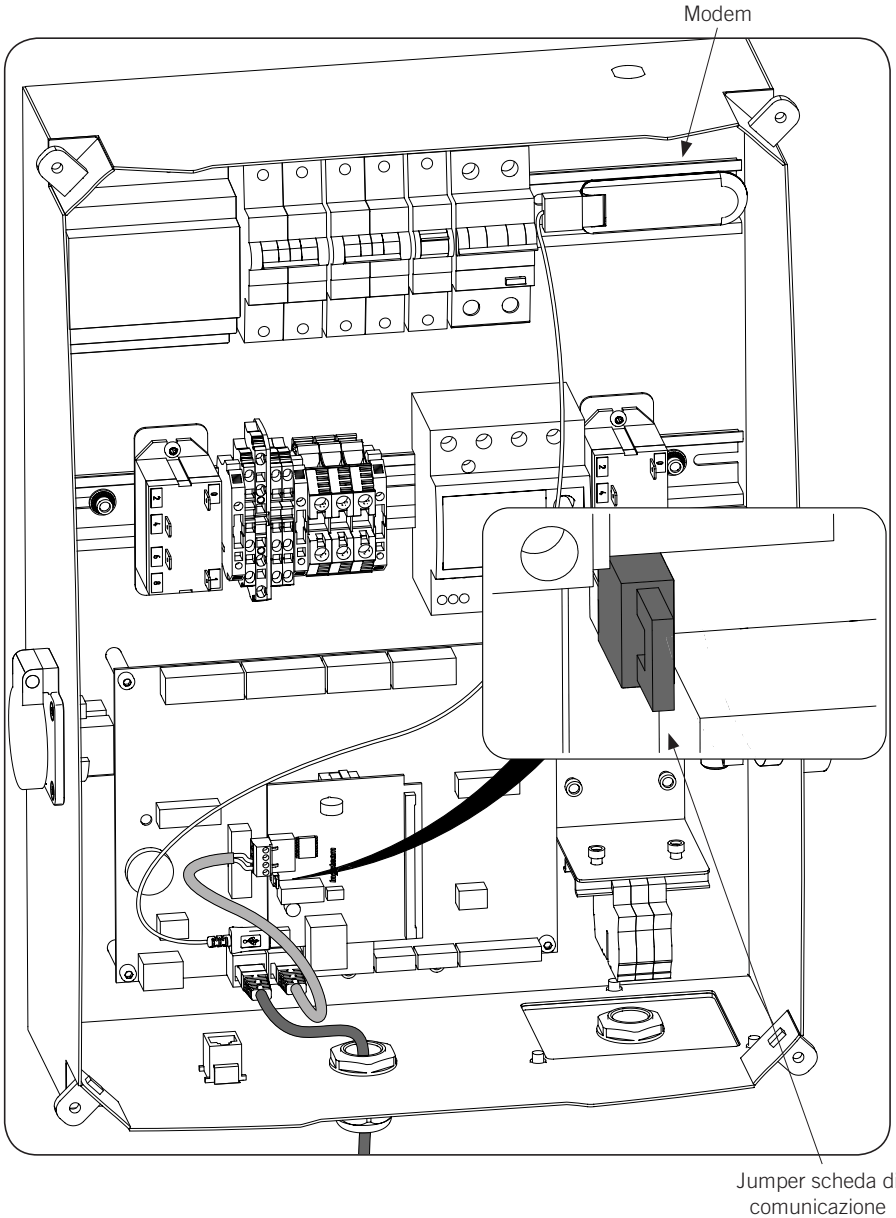
Disinstallare il jumper del fine linea della scheda di controllo e collegare la stazione di ricarica con la stazione seguente nell'anello di comunicazione (cavo grigio scuro nella figura precedente).

2. Collegare il cablaggio che unisce la scheda di controllo con la scheda di comunicazione (vedere il cavo grigio chiaro nella figura seguente).

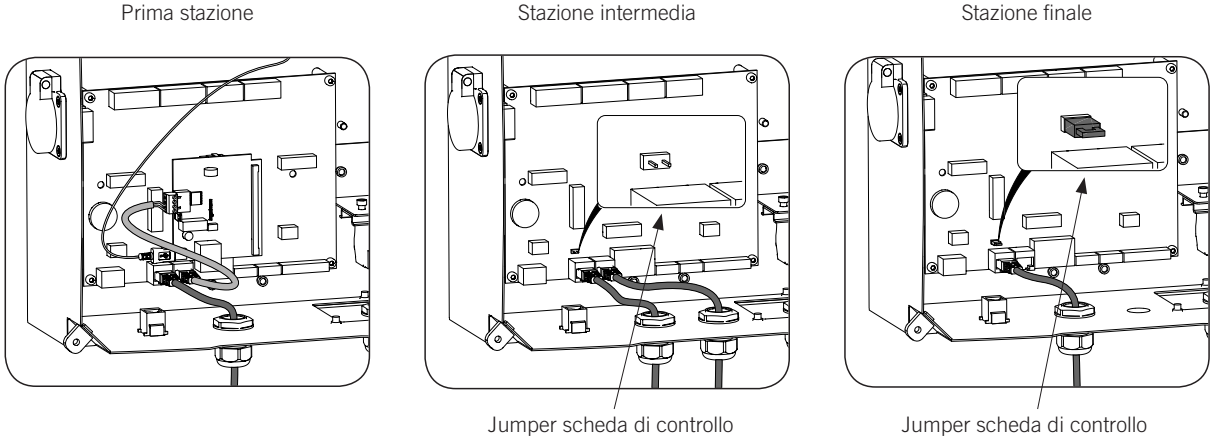
Pin	Colore	Segnale
1	Bianco/Arancione	RS-485 B (+)
2	Arancione	RS-485 A (–)

Collegare il modem USB alla scheda di comunicazione per ottenere il collegamento GPRS/3G (vedere il cavo bianco nella figura seguente).

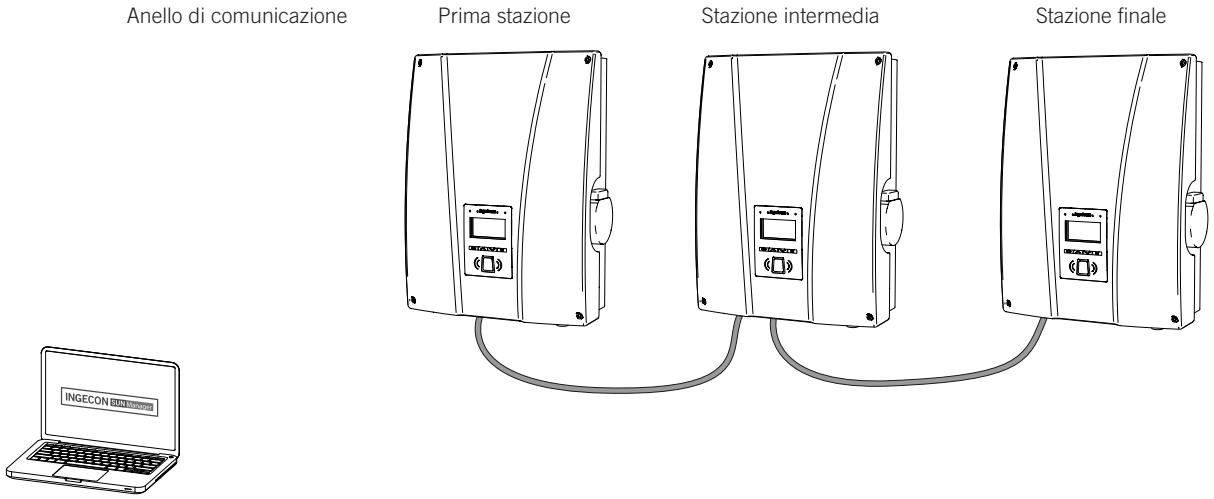
Il jumper della scheda di comunicazione deve restare installato.



3. Collegare le restanti stazioni di ricarica come indicato nella seguente figura:



Il jumper della scheda di controllo deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.

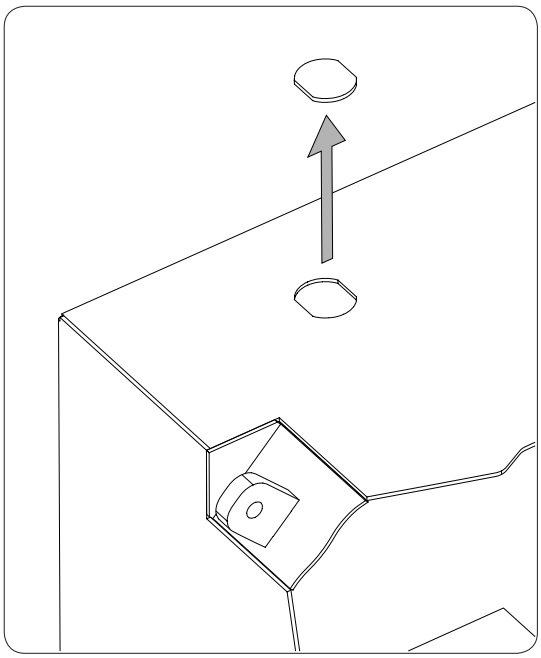


È possibile collegare al massimo 10 dispositivi tra di loro.

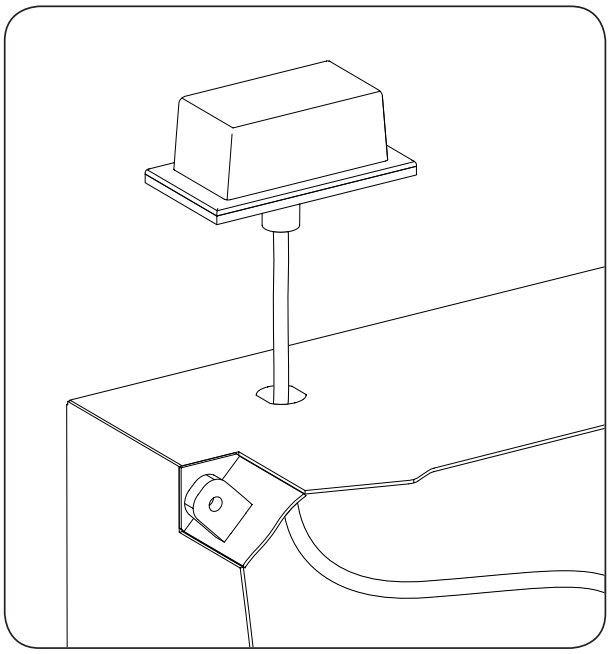
Antenna per modem USB

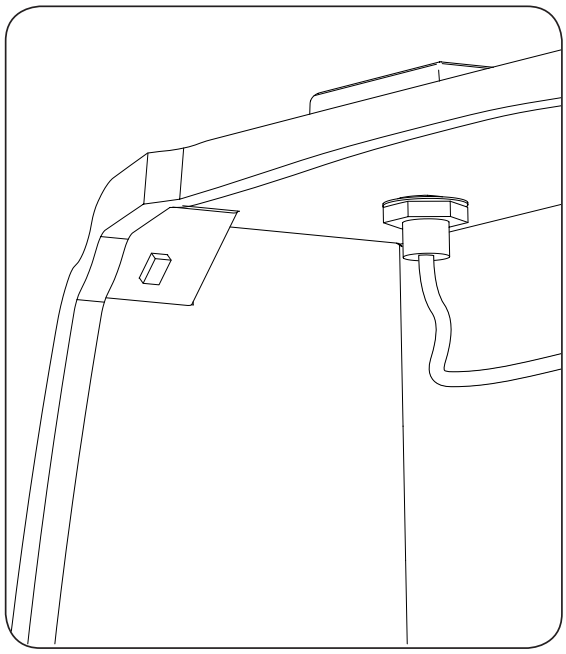
Opzionalmente è possibile richiede un'antenna esterna per ampliare il segnale del modem. Di seguito è indicata la procedura di collegamento.

1. Eliminare il pretagliato della parte superiore della stazione.



2. Inserire il cablaggio dell'antenna attraverso il foro e fissare l'antenna alla stazione tramite il dado in dotazione.





3. Collegare il cablaggio dell'antenna modem.

5. INGEREV CITY

5.1. Comunicazione locale

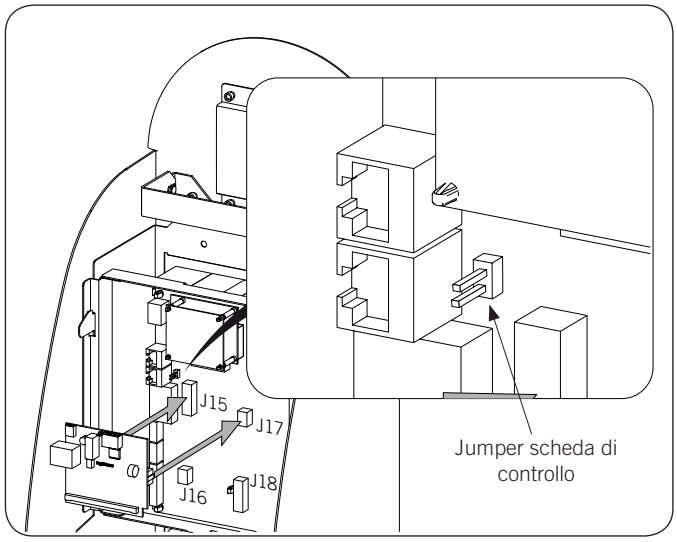
Le stazioni di ricarica INGEREV CITY presentano un bus dati RS-485 locale che consente il collegamento tra diverse stazioni. Per ulteriori informazioni, consultare il relativo manuale di installazione.

5.2. Comunicazione remota

5.2.1. Comunicazione remota tramite modem esterno

1. Collegare la scheda di comunicazione con collegamento Ethernet in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Può essere collegata sia nei connettori J15 e J17 che nei connettori J16 e J18.

Disinstallare il jumper del fine linea della scheda di controllo:



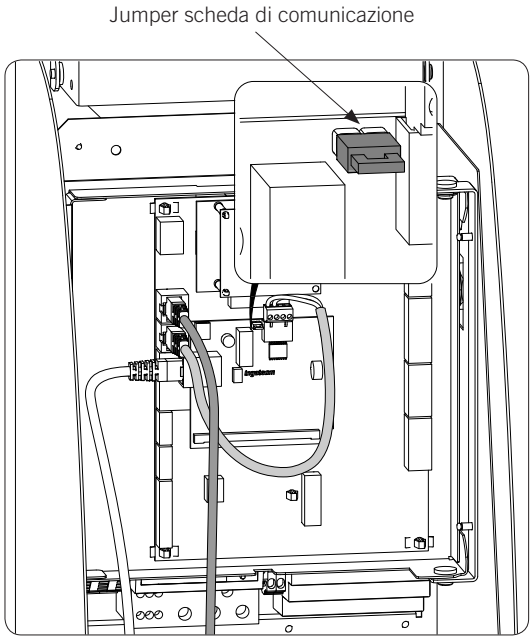
2. Collegare il cablaggio che unisce la scheda di controllo con la scheda di comunicazione (vedere il cavo grigio chiaro nella figura seguente).

Pin	Colore	Segnale
1	Bianco/Arancione	RS-485 B (+)
2	Arancione	RS-485 A (–)

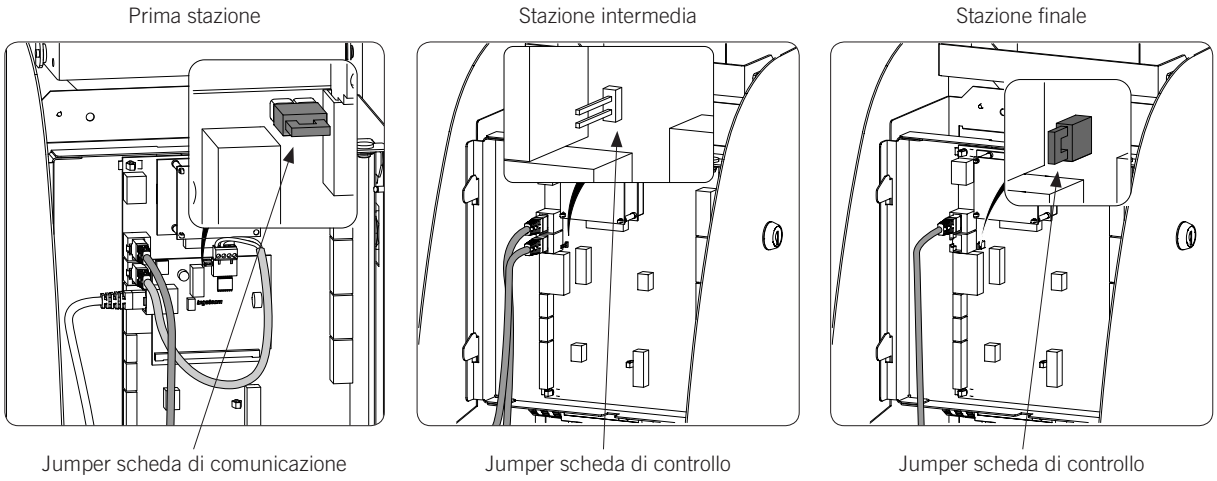
Collegare il modem alla scheda di comunicazione (vedere il cavo bianco nella figura seguente).

Dal connettore RJ45 libero collegare la stazione con la stazione seguente nell'anello di comunicazione (vedere il cavo grigio scuro nella figura seguente).

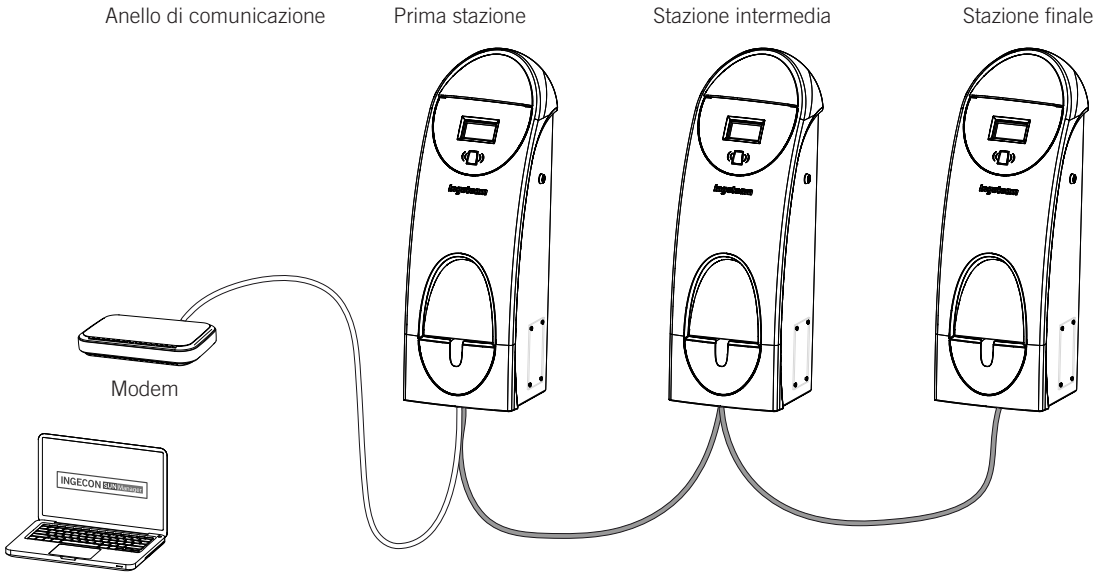
Il jumper della scheda di comunicazione deve restare installato.



3. Collegare le restanti stazioni di ricarica come indicato nella seguente figura:



Il jumper della scheda di controllo deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.

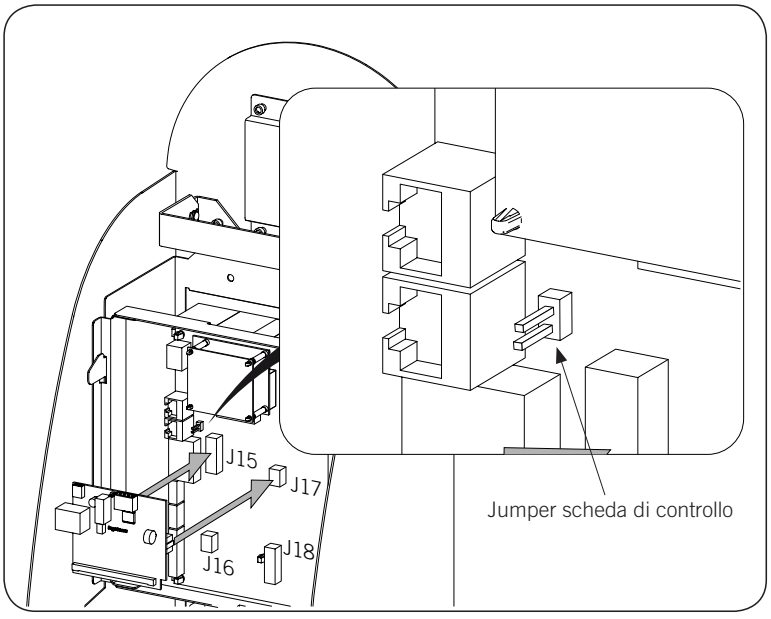


È possibile collegare al massimo 10 dispositivi tra di loro.

5.2.2. Comunicazione remota GPRS/3G tramite modem USB

1. Collegare la scheda di comunicazione in una delle stazioni di ricarica poste a un'estremità dell'impianto per iniziare l'anello di comunicazione. Può essere collegata sia nei connettori J15 e J17 che nei connettori J16 e J18.

Disinstallare il jumper del fine linea della scheda di controllo:



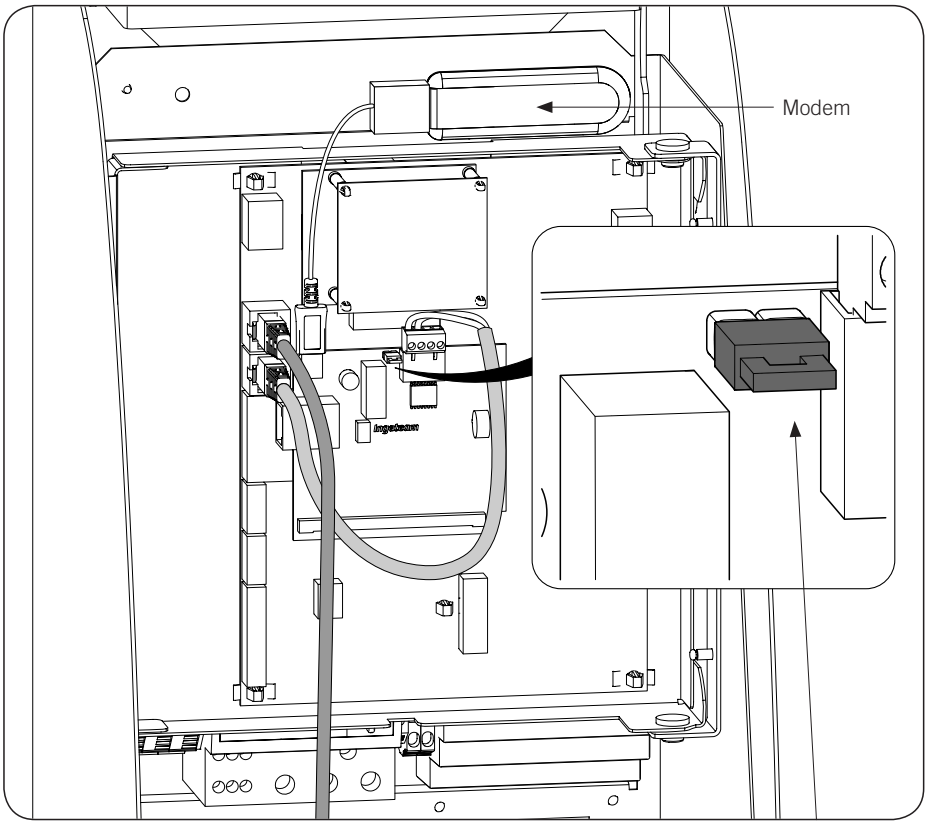
2. Collegare il cablaggio che unisce la scheda di controllo con la scheda di comunicazione (vedere il cavo grigio chiaro nella figura seguente).

Pin	Colore	Segnale
1	Bianco/Arancione	RS-485 B (+)
2	Arancione	RS-485 A (–)

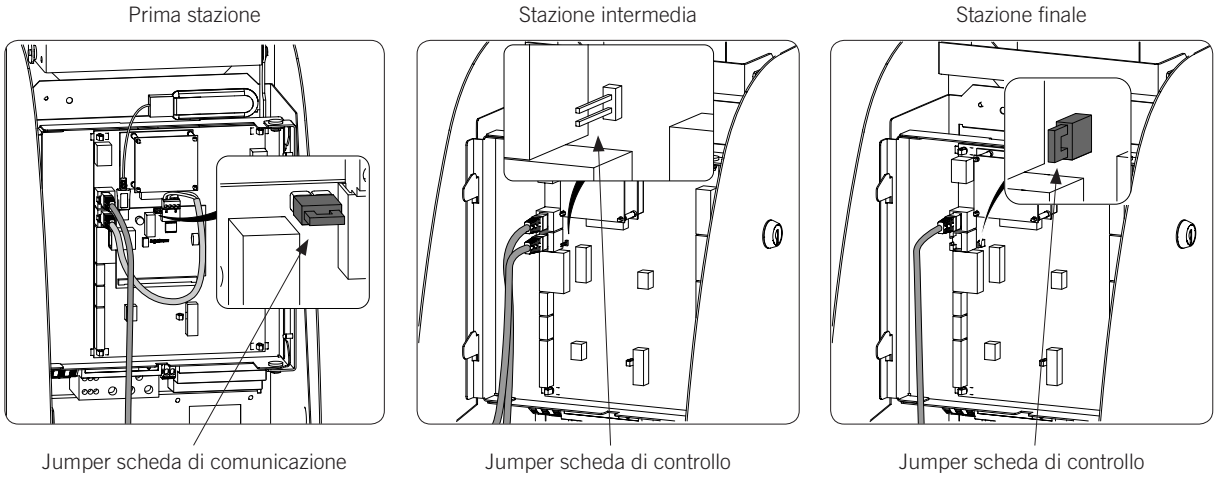
Collegare il modem USB alla scheda di comunicazione per ottenere il collegamento GPRS/3G (vedere il cavo bianco nella figura seguente).

Dal connettore RJ45 libero collegare la stazione con la stazione seguente nell'anello di comunicazione (vedere il cavo grigio scuro nella figura seguente).

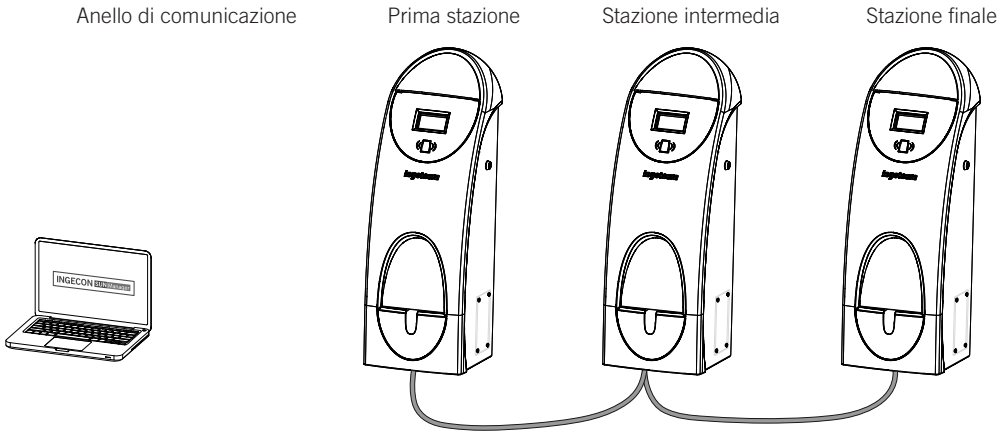
Il jumper della scheda di comunicazione deve restare installato.



3. Collegare le restanti stazioni di ricarica come indicato nella seguente figura:



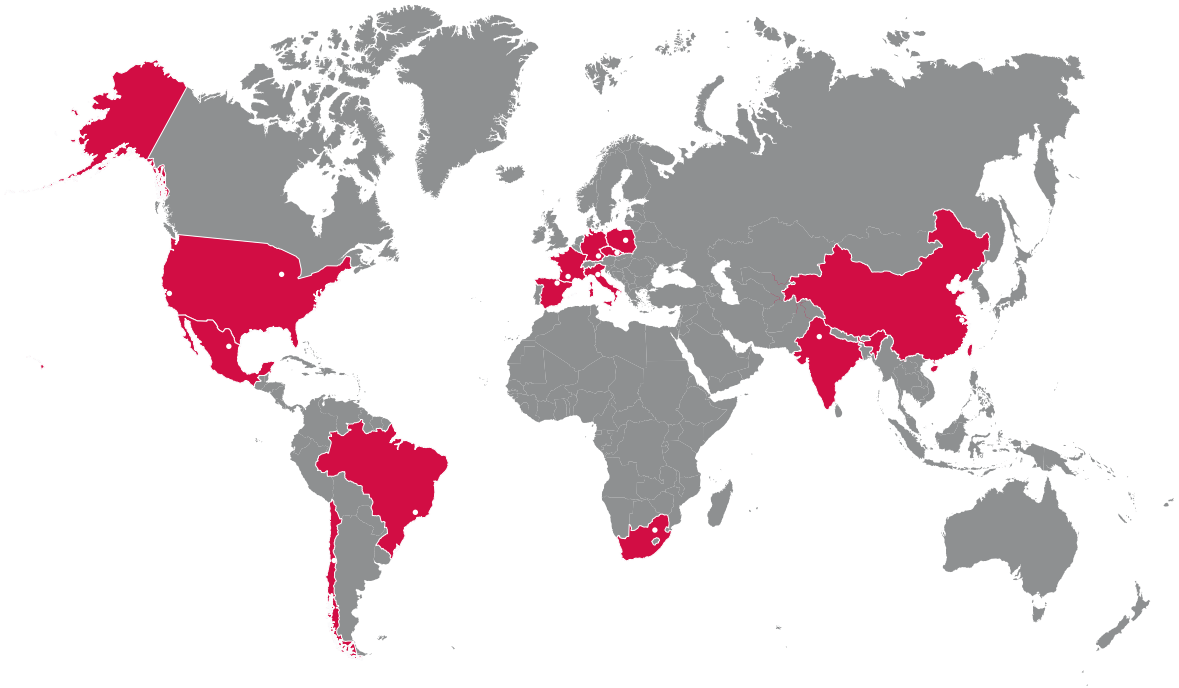
Il jumper della scheda di controllo deve essere disinstallato in tutte le stazioni salvo nell'ultima dell'anello di comunicazione in cui dovrà restare installato.



È possibile collegare al massimo 10 dispositivi tra di loro.

Anmerkungen - Notes - Notas - Remarques - Note - Notas

Anmerkungen - Notes - Notas - Remarques - Note - Notas



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